

Technical White Paper (TWP) 5
Draft Property Analysis Record (PAR) for the Project and Two Alternatives

Please note that that PAR was not developed at this time for Alternative 1 (Baseline).

Please respond to the following questions for TWP 5.

1. It is assumed that Level 2 (enhancement) maintenance and monitoring would last three years. Does three years for Level 2 management and monitoring seem appropriate? Does the time period seem too extensive?

The duration of Level 2 MM depends on the baseline pool conditions at start of Level 2 MM and the state surrounding environment (edge), over which Level 2 MM has no control. In ideal situations, three years of Level 2 might be sufficient; however, in most cases, **five** years are needed to achieve a relative level of confidence that pools are enhanced in perpetuity. Hence, for the purpose of this study, and assuming the goal of having Level 2 pools perform at Level 1 after the monitoring period, I would recommend using 5 years as the basis for cost evaluation.

Comments on the costs are made in TWP 5 directly; some costs are low; others high. Inundation verification costs and fence repair costs cannot be verified, because the text lacks the methods or descriptions of how these costs are determined. For example, the text states that 'certain' complexes require fence repair; however, the linear footage for Levels 1 – 3 are not stated; instead, the same costs are assumed for each level, which is probably unrealistic. What are the assumptions for fence repair (percent of linear foot per year to be repaired); this needs to be identified to verify whether the hours specified for fence repair are adequate.

Hydrological monitoring methods are only described for baseline hydrological inventory, not for Level 1 – 3 monitoring and management; the quantity of pools that would require inundation verification is not apparent.

2. It is assumed that Level 3 (restoration) maintenance and monitoring would last five years. Does five years for Level 3 management and monitoring seem appropriate? Does the time period seem too extensive?

Most vernal pool restoration requires five years of maintenance and monitoring to achieve success criteria. While there is no quantitative comparison and no conclusive evidence of a rigorous sample size, anecdotal evidence shows that five years do not suffice in establishing an ecological functioning vernal pool system. Vernal pool function is largely dependent on hydrology, which is largely dependent on weather conditions. Given the variability of weather conditions in southern California, five years are not enough to establish a vernal pool ecosystem with confidence, specifically assuming that the pools will be compatible with Level 1 pools after five years. **Ten** years of Level 3 monitoring and management is more adequate to attain Level 1 conditions.

See comments for Level 2. Overall, the same cost assumptions are made for Level 2 and Level 3. However, I understand that Level 2 monitoring and management would require less intensive management, because such tasks as topographic repair are less likely in Level 2 than in Level 3.

3. Page 12, Table 3-1. The PAR assumes \$141,004 for baseline hydrological surveys for one-time costs for all complexes. Knowing the requirements for surveying, does this cost seem to align with the level of effort required?

The amount is adequate.

The white paper references the implementation of HGM-based hydrological monitoring methods. However, the HGM does not include a detailed description of monitoring methods, but rather a number of suggested techniques. Furthermore, hydrological monitoring methods for vernal pools have advanced in recent years (e.g., the use of stacked iButtons, water level data loggers, or pressure transducers to monitor water level and temperature). From the documents and materials submitted, it is unclear how the hydrological monitoring costs were derived.

For lack of a conclusive identification of methods used for the baseline hydrological monitoring, I am assuming the following methods from the HMP: “Water depth will be measured 24 hours after the end of a major storm (c. 0.5 in/1.3 cm of precipitation), and every 3-5 days thereafter until the pool has drained (Bauder 1987a, 2005)”. Per TWP 5, a total of 2,861 vernal pools would be surveyed (100%). At three visits per season to all vernal pools in the preserve, the costs are adequate. More visits would require a cost increase.

While hydrological monitoring is the most important monitoring aspect of long-term vernal pool monitoring (without hydrology, there is no pool), I don’t think that every pool must be monitored for hydrology to provide an informative baseline. Monitoring can occur within a stratified sample. Most importantly, baseline monitoring is not sufficient to measure vernal pool functions over time. Level 1 hydrological monitoring should be part of the adaptive management and monitoring protocol, specifically because functioning vernal pool hydrology dictates vernal pool function. The hydrological monitoring protocol as described in the white paper is inadequate.

4. Page 13. Does the contingency fund seem adequate and does the methodology for determining it seem reasonable?

Please confirm that my assumption is correct: After Level 2 (3 years) and Level 3 (5 years) have been completed, it is assumed that each year of the 36-year plan life, two complexes would be at Level 2, and one complex would be at Level 3. Although it’s unlikely that an entire complex would decline, rather, individual pools in multiple complexes would, the above assumption seems fair as an interpolation to arrive at contingency costs. The above assumptions should be clarified in the text.

Vernal pool decline is most likely to happen due to invasive species than the decline of fairy shrimp, because FS sustain themselves in the soil and will recover with appropriate management. Hybridization of FS is explained under changed circumstances and does not factor into the contingency costs. Hence, intensive Level 2/3 FS monitoring is not required, but rather can stay at Level 1. I would reduce the contingency funds to arrive at +/- 10%. Please note that the contingency fund would need to be in place once all pools have reached Level 1 (since the funds for Level 2 and 3 monitoring and management are already accounted for during the first 3-5

years of Level 2/3). This needs to be considered in the total contingency fund. An endowment account will roll these funds over to the next year if they are not used in a given year.

5. Page 14. Do the annual costs in Table 3-4 for Changed Circumstances seem appropriate?

I have no way of reviewing the accuracy and relevance of changed circumstances costs, because there are no methods or detail provided on how these costs were computed. For example, what is 'limited Level 3 management' for burned pools? Is it a percentage of Level 3? I can't evaluate costs on this basis and need more information.

Post-fire management assumptions seem excessive. There is no supporting evidence provided for these assumptions, and they seem pure speculation. While it is expected that fire frequency will increase in San Diego County, and it is reasonable to believe that this will reach a 10-year frequency interval, fires in urbanized areas where there is fire suppression will be more likely to occur every 20-35 years. Most of the City's vernal pool complexes are in urbanized environments that receive fire suppression, and most of San Diego's wildfires occur in the eastern and northern portions of the County. Once a complex is affected by fire, the complex would have to be restored (the funds for this are not verifiable as stated above), and then the contingency funds for Level 3 monitoring would kick in, as described above.

I am not an expert on fairy shrimp cyst bulking, and this method is purely experimental. I cannot comment on the accuracy of this cost.

6. Pages 4-16. Should any additional categories be added Changed Circumstances (refer to Table A-11 for further breakdown of Cost Estimate for Changed Circumstances)?

Have violations been addressed and the costs to restore illegally graded or flooded pools? The costs would be similar to post-fire management costs (restoration and Level 3 monitoring) on 2 average size complexes (100 pools total) for the life of the plan (36 years).

7. Table A-5. Does the data tracking and reporting by Bio III (line item at the bottom of the table), 1 day per week annually seem appropriate...Does it seem excessive?

The hours are adequate based on the number of site visits and associated data entry requirements specified in the plan for Level 1 monitoring (see example schedule). However, I think the field schedule is excessive (see my comments below), and therefore, the costs are excessive. Please note that data entry would occur into the SDMMP multi-taxa database (I assume).

8. For all Levels 1, 2, and 3, management and monitoring, are there any tasks missing? Are there any tasks that should be removed? Do the costs and hours proposed seem adequate?

See cost comments in the text and tables. Level 1 example of site visits schedule (see example schedule Table X) is excessive, and it does not match the quantitative and qualitative survey methods description in TWP 3&4.

Site Specific Management Plans (SSMP) are specified for 'certain complexes'; however, the development of SSMP for those pools that don't have any plans don't seem to be included in the one-time costs; these costs should be added in addition to the development of detailed restoration plan (see text comments).

9. Table A-9. Do the dethatching buffer sizes seem appropriate and do the dethatching costs seem appropriate?

Appropriate.

10. Table A-10. Do the fully loaded consultant staff rates seem consistent with known current rates?

The consultant rates seem low (see mark-up in text), and the mileage rates high. In addition, some of the tasks for a senior biologist can be performed by experienced vernal pool biologists at lower rates (see text mark-up). Travel costs are adequate. It should be noted in the document that the contractor rates are not subject to prevailing wages.

11. Tables A-6 through A-8. Do these tables assist the reader in understanding the total project costs, annual costs, and one-time costs? Is this information sufficiently covered in Table A-5?

Yes. However, these are complex tables, and not having been part of the development process does not give me enough information to thoroughly understand the information in the tables. I have to trust that the baseline assumptions are correct. In the future, it would help to be part of the discussions had to arrive at the conclusions in order to properly whether the conclusions are accurate and adequate.

12. Increases in costs over time have not been included. How would you suggest that costs over the 36 year period of the HCP keep up with inflation?

Currently, and predicted to persist in the future, interest rates are very low, and the market expects a reduction of inflation rates over the next 30 years. Because we cannot predict inflation rates, I would recommend to apply a 3% inflation rate, which is conservative (the market expects inflation over the next 30 years to be around 2.5%, or a little less). This can be backed up by comparing yields on 30-year U.S. Treasury bonds, both inflation-adjusted and non-inflation adjusted.

For calculation of endowments for long-term habitat management, a 2% yield, net of inflation, may be applied. That is, to generate \$20,000 per year, which can be adjusted for inflation using the 3% rate as stated above, one would need \$1,000,000 ($= \$20,000 / 0.02$).

The 2% net yield is low; historically, it has been more like 3%. However, in today's ultra-low interest environment, the yield on 30-year, inflation-adjusted bonds (which is supposed to indicate the same inflation-adjusted yield) is only 0.5% (!) as of June 2012. That is too low for planning purposes (Jun Onaka, pers. comm.).

Depending on how and where the endowment is invested, a 3.5% – 4.5% rate of return can be expected on the investment (the 4.5% is the figure that the San Diego Foundation uses, vs. the National Fish and Wildlife Foundation and Fish and Game Foundations that operate at a 3.5% rate of return).

General comments on approach and methods that affect costs:

The Adaptive Monitoring and Management methods identified in the TWP 3&4 seem unfinished; I assume that this TWP will be significantly modified. This will likely affect the PAR assumptions. The following clarifications/modifications are necessary to review costs:

Fundamental Assumptions:

- This is not a PAR. It's the cost calculation that would be input into a PAR. A PAR requires the computation of inflation and rate of return to generate the interest that would provide the annual management fee. In addition, there is no mention on how the first five years would be funded in lieu of enough interest being generated to fund monitoring and management; the description of a baseline monitoring and management fund prior to the long-term funds becoming available should be described in TWP5.
- CRAM and HGM are both mentioned as methods to evaluate vernal pool function; however, they are mutually exclusive. While Vernal Pool Module CRAM is being increasingly required by the agencies to evaluate functions, trend monitoring can borrow from methods described in the Vernal Pool HGM (Bauder et al. 2009) without necessarily requiring to compute the entire functional analysis described in the HGM document.

Hydrology:

- The white papers warrant a more detailed description and evaluation of hydrological monitoring. Hydrological monitoring for Level 1 is absent; visual inundation checks are included in qualitative assessments. However, hydrological monitoring is extremely important as it dictates the function of a vernal pool. Quantitative hydrological monitoring on a stratified basis per complex using data loggers should be conducted for the life of the plan.
- Rain data for purpose of hydrological monitoring: use average over 30 years and collect data during dry years, too, to put it into a range of normal.

Adaptive Management Methods:

- Field visits are unreasonably high for stewardship (Level 1); Long-term adaptive management can be adequately performed with 2 visits/year every 3 years (this is 12 visits over the plan duration).
- Focused sampling should be done on sentinel and rotating pools for all levels. Too frequent monitoring on sentinel pools is very impactful over time.
- I disagree with the use of cover class as the only indicator of plant function; specifically for Level 2 and 3. Plant composition, frequency and richness are important factors to understand success trends of enhanced and restored pools to

bring them to Level 1. Once they are at Level 1, monitoring can taper off significantly.

- FS sampling every five years suffices (this is 7 samples over the life of the plan); more would impact pools. FS dry season sampling should not occur in sentinel pools (too impactful). I would recommend to eliminate dry season sampling and consider developing a wet season sampling design that answers the question of FS distribution and biology. The main questions we are trying to answer here is that the FS is stable and complex. Hence, hydrological data collection is important, because FS may not hatch in dry years, and this information is more important than excessive cyst sampling.
- Annual quantitative sampling for each complex is excessive. I recommend that, for purpose of PAR, use a percentage over the life of the plan duration for quantitative sampling (every three years for plants; every five years for FS).
- Vernal pool management should be described based on conceptual models; this is completely lacking. Based on these models (species may be grouped or discussed in guilds), only a few target species may be selected to conduct long-term adaptive management; not all vp species must be present in pools to be characterized as functioning pools.
- The development of a management database is not necessary. Data would be housed at the SDMMP multi-taxa database currently being developed.

DRAFT

**TECHNICAL WHITE PAPER 5:
COST EVALUATION FOR THE CITY OF SAN DIEGO
VERNAL POOL HABITAT CONSERVATION PLAN
MONITORING AND MANAGEMENT PROGRAM**

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Please note that the Technical White Papers are the products of professional consultants hired by SANDAG Service Bureau, and that the City and/or Wildlife Agencies may not concur with the recommendations contained in these reports.

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TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
CHAPTER 1 – INTRODUCTION	1
1.1 Project Background.....	1
1.2 Overview of VPMMP	3
1.3 Overview of the VPMMP Cost Evaluation	3
CHAPTER 2 – COST ASSUMPTIONS AND METHODOLOGY.....	5
2.1 Cost by Management Level	5
2.2 Other One-Time and Potential As-Needed Costs	6
CHAPTER 3 – COST ESTIMATE FOR VPMMP IMPLEMENTATION	9
3.1 Project Costs	9
3.1.1 Overview	9
3.1.2 Summary of Project Costs.....	11
3.1.3 Annual Contingency Fund	13
3.1.4 Changed Circumstances	14
3.2 Additional Costs For Alternative 2 – Expanded Conservation.....	16
CHAPTER 4 – REFERENCES	19
ATTACHMENT A. Cost Evaluation	

LIST OF TABLES

<u>Table</u>	<u>Page</u>
3-1 One-Time Costs for VPMMP-Required Monitoring and Management Level for Level 2 and 3 Complexes ¹ , Baseline HGM Surveys and Fence/Sign Installation.....	12
3-2 Annual Ongoing VPMMP Level 1 Monitoring and Management Costs	12
3-3 VPMMP Implementation Costs for Life of the Project (36 Years)	13
3-4 Cost Assumptions for Changed Circumstances	14
3-5 Additional Annual Costs Associated with VPMMP Implementation for Alternative 2	17

CHAPTER 1

INTRODUCTION

1.1 PROJECT BACKGROUND

The San Diego Association of Governments Service Bureau (SANDAG Service Bureau) will prepare a Vernal Pool Habitat Conservation Plan (VPHCP) for the City of San Diego (City) largely based on information contained in a series of Technical White Papers (TWPs). The Planning Area for the VPHCP is the geographical extent of land that will be included in the VPHCP and for which the protections provided under the VPHCP are afforded to the seven focal species. For the City's VPHCP, these lands include the entire jurisdictional boundaries of the City and three areas owned by the City's Public Utilities Department in the unincorporated portion of San Diego County. The Planning Area's extent is, by design, the area covered by the City's Multiple Species Conservation Program (MSCP); the VPHCP is a separate but compatible conservation plan for vernal pools and seven endangered focal species not covered under the City's MSCP.

Many lands included in the Planning Area are not under the local land use jurisdiction of the City. These lands could include special districts such as school districts, military lands, other federal properties, and state lands. The regulatory requirements of the VPHCP are not applicable to lands not under the land use jurisdiction of the City. If land ownership is transferred and subsequently comes under the City's jurisdiction, or if the owner voluntarily requests inclusion, the VPHCP regulatory requirements will be applied after undergoing the appropriate amendment process, as outlined in the VPHCP.

The TWPs and VPHCP focus on seven target vernal pool species consisting of five plants and two crustaceans:

- Otay Mesa mint (*Pogogyne nudiuscula*)
- San Diego Mesa mint (*Pogogyne abramsii*)
- Spreading navarretia (*Navarretia fossalis*)
- San Diego button-celery (*Eryngium aristulatum* var. *parishii*)
- California Orcutt grass (*Orcuttia californica*)
- Riverside fairy shrimp (*Streptocephalus wootoni*)
- San Diego fairy shrimp (*Branchinecta sandiegonensis*)

The TWP topics are as follows:

- TWP 1: Focal Species Status Update in the City of San Diego
- TWP 2: Assessment of Focal Species Conservation
- TWP 3: Development of Adaptive Management Strategy, and TWP 4: Development of Monitoring Strategy (a combined document) (referred to as TWP 3 & 4)
- TWP 5: Cost Evaluation for Implementation of Management and Monitoring
- TWP 6: Recommendations for Conditions of Coverage
- TWP 7: Conservation Analysis
- TWP 8: Preserve Management Funding Mechanisms

This is TWP 5. It provides a cost evaluation for implementing a monitoring and management program for the City's proposed VPHCP Preserve (Preserve) over the 36-year life of the project. Monitoring and management costs are estimated based on the activities included in the vernal pool monitoring and management program (VPMMP), developed in the combined document TWP 3 & 4 (AECOM 2012a). The VPMMP provides management and monitoring strategies, directives, and recommendations for lands containing vernal pools in the VPHCP Preserve to preserve and/or restore their biological components, particularly the seven focal threatened and endangered species. Currently, the City is responsible for implementing the VPMMP on lands subject to City jurisdiction under City ownership. It is possible that in the future the City may acquire additional privately owned lands in the Preserve within their jurisdiction.

The proposed VPHCP Preserve (the Project) would conserve lands subject to City jurisdiction that include 2,861 vernal pools within a total of 58 vernal pool complexes.¹ There are two alternative Preserve boundaries. Alternative 1 (Baseline) conserves 660 fewer vernal pools than the Project, including 2,201 vernal pools within a total of 43 complexes in the Preserve. Alternative 2 (Expanded Conservation) conserves 37 more pools than the Project, generally located on Del Mar mesa and Otay Mesa, and includes 2,898 vernal pools within the same 58 complexes as the Project. TWP 2 (AECOM 2011) provides more detail on the Project and two alternatives. It is anticipated that Alternative 1 (Baseline) will not be implemented because it does not provide adequate coverage for the seven vernal pool focal species (as detailed in TWP 6 [AECOM 2012b]); therefore, TWP 5 includes a cost evaluation for the Project and Alternative 2 (Expanded Conservation) only.

¹ Vernal pool complexes may include two to several hundred individual vernal pools (Keeler-Wolf et al. 1998). Typically, the pools in a complex are connected through the landscape, including the supporting watershed and upland habitats. These vernal pool complexes were given identification numbers by Bauder (1986). The numbers were updated by the City of San Diego's Vernal Pool Inventory (2004) and again updated by SANDAG Service Bureau (2011).

1.2 OVERVIEW OF VPMMP

The VPMMP developed in TWP 3 & 4 uses a three-tiered approach to adaptive monitoring and management that is applied to individual vernal pool complexes. Adaptive management is an iterative process of learning about a resource through monitoring, and then making decisions to optimize management of that resource to achieve specific objectives.

The goals of the monitoring and management levels are as follows:

- Level 1 – Stewardship: *maintain* existing habitat conditions and existing focal species population status.
- Level 2 – Enhancement: *stabilize* focal species population status by enhancing habitat conditions to a level that can support existing populations.
- Level 3 – Restoration: *remediate* declining focal species population status by restoring habitat conditions to a level that can support baseline (defined by the City's 2004 Vernal Pool Inventory) focal species populations.

Each of the three levels of monitoring and management is linked to the VPMMP objectives (as defined in TWP 3 & 4) for existing habitat conditions and focal species population status within a complex.

Each complex is evaluated to identify adaptive monitoring and management actions based on triggers directly tied to the VPMMP objectives. The VPMMP describes the necessary monitoring methods used for each level of monitoring and the triggers for management actions based on the data collected during monitoring. The necessary management actions to be taken based on the triggers for each level of maintenance are also identified. Necessary actions are those required to conserve and protect populations of each of the seven focal species under the VPHCP. Each vernal pool complex is assigned a level based on necessary management actions.

1.3 OVERVIEW OF THE VPMMP COST EVALUATION

The VPMMP for the VPHCP Preserve identifies three levels of monitoring and management, with the level of effort (and therefore cost) required to conserve and protect populations of the seven focal species under the VPHCP increasing from Level 1 (Stewardship) to Level 3 (Restoration). For each VPMMP level, TWP 5 estimates a general annual cost for the necessary monitoring and management actions (Chapter 2). Those general costs for each level are then

used to determine various categories of VPMMP implementation costs under the Project (Chapter 3), including required and recommended activities for each complex. Other costs for VPMMP implementation (such as initial baseline hydrological surveys, data tracking/reporting, and costs for changed circumstances) and an annual contingency are also estimated.

The various VPMMP implementation costs for the Project are then compared to the costs for Alternative 2 (Chapter 3). Other potential “as-needed” costs associated with implementation of certain activities identified in the VPMMP, which may not be necessary for all complexes, are also provided in Chapter 3 for consideration by the City.

Attachment A includes the following tables for the cost evaluation:

- Table A-1: Level 1 Monitoring and Management Costs
- Table A-2: Level 2 Monitoring and Management Costs
- Table A-3: Level 3 Monitoring and Management Costs
- Table A-4: Other One-Time (Mandatory) and Potential As-Needed (Optional) Costs for VPHCP Preserve Monitoring and Management
- Table A-5: City of San Diego VPHCP Preserve Monitoring and Management Comprehensive Cost Estimate by Complex for the Project
- Table A-6: Summary of One-Time Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)
- Table A-7: Summary of Annual Ongoing Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)
- Table A-7: Summary of Total Costs for VPHCP Preserve Monitoring and Management by Complex for the 36-Year Life of the Project (2012 Dollars)
- Table A-9: Weed Control Cost Estimate Detail
- Table A-10: City and Consultant Staff 2012 Rates
- Table A-11: Cost Estimate for Changed Circumstances
- Table A-12: Fence and Sign Installation Cost Assumptions

CHAPTER 2

COST ASSUMPTIONS AND METHODOLOGY

2.1 COST BY MANAGEMENT LEVEL

Attachment A provides a cost estimate for the necessary activities associated with each monitoring and management level, as defined in the VPMMP (Attachment A-1 for Level 1, Attachment A-2 for Level 2, Attachment A-3 for Level 3). Detailed assumptions for each activity associated with a level are provided in the Attachment A tables. Overall assumptions for developing costs for each level are provided below:

- Estimated costs are in 2012 dollars.
- Cost estimates are generalized based on AECOM's previous experience and agency input (City, SANDAG Service Bureau, the U.S. Fish and Wildlife Service [USFWS], and the California Department of Fish and Game [CDFG]) on overseeing and implementing monitoring and management of vernal pools in the San Diego region.
- Adequate access protection (e.g., fencing, signage) is in place or will be installed at each complex in the Preserve prior to implementation of other management activities. One-time costs for fence and sign installation (where needed, based on City input), as well as repair and replacement costs (assumed under each management level), are included in Attachment A. Site patrol/enforcement is assumed under Level 1 as part of annual ongoing Stewardship costs.
- Management and monitoring activities will be performed by either City staff or Consultants depending on the level and type of activity. In general, Level 1 activities will be performed by City staff. Note that Level 1 management activities (trash removal, access control maintenance, edge effect repair) are also performed under Levels 2 and 3 by City staff. It is assumed that Level 2 monitoring activities will be performed by City staff, while Level 2 management will be performed by Consultant staff. It is assumed that Level 3 monitoring and maintenance activities will be performed by Consultant staff.
- City and Consultant biologists performing monitoring and management activities will have the appropriate permits to work with the focal species and have a minimum of 3 years of local field experience with vernal pool vegetation, fauna, hydrology, and soils.
- Weed control costs for focal species vernal pools were extrapolated based on the average size of vernal pools with focal species within the Preserve (0.018 acre). The area of weed

control per pool was derived using a basin-to-watershed ratio of approximately 1:5 for Level 2 Weed Control (20-foot buffer treated around each pool) and approximately 1:10 for Level 3 Weed Control (35-foot buffer treated around each pool). Weed control costs for focal species vernal pool include labor plus other direct costs such as field vehicle rental, fuel, herbicide, and equipment. A separate line item is included in each management level for general weed control of the upland watershed and non-focal-species vernal pools. Table A-6 in Attachment A provides more detail on weed control cost estimates.

- For cost estimating purposes, Consultant rates are based on typical standard rates for Consultant staff. City staff costs are based on 2012 rates provided by the City. Other direct costs (fringe, overhead) and travel (vehicle use and fuel) are assumed in the fully loaded staff rates. Details on City and Consultant rates are provided in Table A-7 in Attachment A.

2.2 OTHER ONE-TIME AND POTENTIAL AS-NEEDED COSTS

Table A-4 of Attachment A includes other on-time costs that are mandatory for VPMMP implementation, as well as potential as-needed costs that are optional.

One-time mandatory costs involve a baseline hydrological survey to measure maximum basin depth and watershed connectivity (based on assessment methods identified under the Hydrogeomorphic [HGM] Approach [Bauder et al. 2009]) for every vernal pool within the VPHCP Preserve (regardless of management and monitoring level), including lands under City control and lands under other ownership. The baseline hydrological data will be used during VPMMP Level 2 and 3 monitoring to evaluate changes in vernal pool water storage and hydrological connectivity. All complexes need baseline hydrological data collected, in the event that a Level 1 complex declines to Level 2 or 3, at which point comparisons to baseline hydrological data would be required. The cost for this one-time survey is detailed in Table A-4 (broken down between City-controlled and other lands), and is incorporated into the cost of VPMMP implementation (Tables A-5 through A-7). It is assumed that this baseline hydrological survey will be performed during the first 5 years of VPMMP implementation. It is assumed that baseline hydrological data collection for Level 2 and 3 complexes is required to be funded under the VPHCP. It is recommended that baseline hydrological data collection for Level 1 complexes be funded via an outside funding source (e.g., a grant).

Optional costs for Levels 1, 2, and 3, such as site-specific restoration plans and topographic restoration, are not included as part of the total implementation cost for the VPMMP levels because not all complexes, if any, will require the as-needed activities. These costs are provided

in Table A-4 for reference if and when VPMMP monitoring indicates the need for these activities (as determined by the City). If a complex changes management level, the City can choose to add these activities, as needed. It is assumed that funding for as-needed activities would come from the annual contingency fund, at the discretion of the City (see Section 3.1.3).

Optional costs also include development of an integrated database tracking system tailored specifically for the VPHCP Preserve. The City is not required to have an integrated database tracking system. A general cost estimate is provided for informational purposes only.

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CHAPTER 3

COST ESTIMATE FOR VPMMP IMPLEMENTATION

3.1 PROJECT COSTS

3.1.1 Overview

The estimated cost for the different monitoring and management levels was used to determine a total cost of implementation of the VPMMP at each complex in the Preserve over the life of the Project (36 years). Costs differ at each complex based on the number of vernal pools with focal species, level of effort associated with assigned monitoring and management level (Levels 1, 2, and 3), and type of staff performing the monitoring and management (City or Consultant). Table A-5 of Attachment A provides various types (based on land ownership) and phases (one-time versus ongoing) of VPMMP implementation costs by complex, as follows:

- The total one-time cost to implement enhancement (Level 2) and restoration (Level 3 or Site-Specific Management Plan) for each complex within the VPHCP Preserve, regardless of land ownership and management responsibility. The following assumptions were made about the time-frame for one-time monitoring and maintenance costs for these specific VPMMP levels:
 - Level 3 (Restoration) maintenance and monitoring would last 5 years. Each complex at Level 3 is assumed to be stabilized following the 5-year period and will be elevated to Level 1 (Stewardship) status.
 - Level 2 (Enhancement) maintenance and monitoring would last 3 years. Each complex at Level 2 is assumed to be stabilized following 3 years, and will then be elevated to Level 1 (Stewardship) status.
- The City's one-time cost to implement enhancement (Level 2) and restoration (Level 3 or Site-Specific Management Plan) for each complex within the VPHCP Preserve.
- The total annual ongoing cost for Level 1 (Stewardship) monitoring and management at each complex within the Preserve, regardless of land ownership and management responsibility.
- The total annual ongoing cost for Level 1 (Stewardship) monitoring and management at each complex (or portion of a complex) on City-controlled land within the Preserve.

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- The total cost for the VPMMP recommended (based on input from the City and resource agencies) monitoring and management level for each complex within the Preserve (ranges from Level 1 to Level 3, or may include Site-Specific Actions), regardless of land ownership and management responsibility. The recommended level is not required to be implemented under the VPHCP, but is provided for consideration should additional funding become available in the future. Not all complexes have a recommended monitoring and management level.
 - The City's potential cost for the VPMMP recommended monitoring and management level at each complex (or portion of a complex) on City-controlled land within the Preserve, should additional funding become available.
 - The total cost for VPMMP implementation over the 36-year life of the Project (in 2012 dollars, not adjusted for inflation), regardless of land ownership and management responsibility, including the one-time required costs, annual ongoing costs, reporting, changed circumstances, and contingency.
 - The City's total cost for VPMMP implementation for complexes on City-controlled land within the Preserve over the 36-year life of the Project, including the one-time required costs, annual ongoing costs, reporting, changed circumstances, and contingency.

Note that certain complexes do not have a required monitoring and management level in the VPMMP (noted as "None" in Table A-5). Some complexes do not have focal species and do not warrant monitoring and management, as agreed upon by the City, SANDAG Service Bureau, USFWS, and CDFG. Some complexes are privately held and may seek development entitlement in the future. During the development entitlement process, the City will ensure that the property owner implements the Recommended Management activities as appropriate for the level of mitigation outlined in the VPMMP. Other complexes that are not under City control have been developed pursuant to prior approval by the City of San Diego. No management was required at that time, nor is any management being required as part of the VPHCP. As funding becomes available, the City may work with the owner to implement the Additional Recommended Management activities.

Certain complexes may also have Site-Specific Management Plans (SSMP), instead of a required monitoring and management level. SSMPs are existing or future resource agency-approved plans that guide monitoring and management activities for the complex. For cost estimating purposes, it is assumed that costs for implementation of an SSMP are comparable to a Level 3 monitoring and management level. In some cases, privately owned complexes with an SSMP have a recommended monitoring and management level in the event that the City gains control of the

land. For resource agency-approved mitigation projects, it is assumed that, after 5 years of Level 3 maintenance and monitoring, the site will be elevated to Level 1, and maintained at that level in perpetuity.

In addition to management and monitoring activities, it is assumed that City staff time will be required for data tracking, analysis, and reporting. City staff will also need to coordinate with private landowners and managers regarding VPMMP required activities, including obtaining required data and reporting information for focal species vernal pools on private land. The cost estimate assumes an average time commitment of one day a week for a City biologist (Biologist III) for this effort, which is included as an individual line item in Table A-5.

The cost calculation methodology allows the City the flexibility to adjust complex-specific costs as adaptive management and monitoring decisions are made in the future. If, through management and monitoring (as detailed in the VPMMP in TWP 3 & 4), it is determined that the management level for a complex must be elevated or lowered, the City can adjust the cost estimate for that particular complex using the management and monitoring level-specific costs in Tables A-1 through A-3. Costs can be tailored to reflect specific management and monitoring needs identified for a complex.

3.1.2 Summary of Project Costs

The tables below summarize the one-time and annual ongoing Project costs, as well as the total costs for the 36-year life of the Project. Table 3-1 summarizes the one-time costs for implementation of the VPMMP-required monitoring and management level by geographic area (3-year initial period for Level 2 complexes and 5-year period for Level 3 or SSMP complexes), as well as the one-time costs for HGM baseline surveys (all complexes) and fence and sign installation (at certain complexes, as detailed in Table A-12). Table 3-1 does not include complexes at Level 1, because those costs are assumed in the annual ongoing cost in Table 3-2.

Table 3-2 summarizes the annual ongoing costs for every complex at Level 1 by geographic area. After the initial 3-year period for Level 2 complexes and 5-year period for Level 3 or SSMP complexes, all complexes are assumed to be maintained at Level 1, as shown in Table 3-2.

Table 3-3 includes the total cost for VPMMP implementation over the 36-year life of the Project. The total cost for VPMMP implementation was generated based on the total of the one-time costs for the VPMMP-required monitoring and management level (Level 2, Level 3, or SSMP complexes) plus annual ongoing Level 1 costs for all complexes.

Cost assumptions for contingency and changed circumstances are summarized in Tables 3-2 and 3-3, and discussed in more detail in Sections 3.1.3 and 3.1.4, respectively.

Table 3-1
One-Time Costs for VPMMP-Required Monitoring
and Management Level for Level 2 and 3 Complexes¹, Baseline HGM Surveys and
Fence/Sign Installation

Cost Category	Total Costs (\$)	City Cost (\$)
Subtotal for Vernal Pool Complex Monitoring and Management by Geographic Area	6,127,543	694,891
North	3,581,379	447,615
Central	79,064	47,439
South	2,467,100	199,837
Baseline HGM Hydrological Surveys	141,004	73,287
Fence/Sign Installation	790,878	287,134
TOTAL ONE-TIME COST	7,059,425	1,055,312

¹ One-time costs are for an initial 3-year period of monitoring and management for Level 2 complexes and a 5-year period for Level 3 complexes. This does not include Level 1 complexes (included in Table 3-2).

Table 3-2
Annual Ongoing VPMMP Level 1 Monitoring and Management Costs²

Cost Category	Total Costs (\$)	City Cost (\$)
Subtotal for Vernal Pool Complex Monitoring and Management by Geographic Area	647,336	261,352
North	209,920	76,844
Central	98,454	65,383
South	338,962	119,125
Reporting	36,665	36,665
Changed Circumstances	137,931	137,931
Annual Contingency	43,007	43,007
TOTAL ANNUAL ONGOING COST	864,939	478,955

² Annual costs are ongoing once a complex is at Level 1. Level 2 complexes will be at Level 1 after 3 years, and Level 3/SSMP complexes will be at Level 1 after 5 years.

Table 3-3
VPMMP Implementation Costs for Life of the Project (36 Years)³

Cost Category	Total Costs (\$)	City Cost (\$)
Subtotal for Vernal Pool Complex Monitoring and Management by Geographic Area	19,765,905	9,186,398
North	8,849,210	3,434,368
Central	1,882,743	1,882,743
South	9,033,953	3,869,287
Baseline Hydrological Surveys	141,004	73,287
Fencing	790,878	287,134
Reporting	1,319,932	1,319,932
Changed Circumstances	4,965,518	4,965,518
Total Contingency	1,548,246	1,548,246
TOTAL	28,531,483	17,380,515

³ Includes initial one-time costs for Level 2 and 3 complexes, plus ongoing costs for complexes at Level 1.

3.1.3 Annual Contingency Fund

Annual ongoing costs assume that all complexes will be maintained at Level 1 monitoring and maintenance (after initial Level 2 and 3 complexes are elevated to Level 1 status). However, over time it is realistic to anticipate that some complexes may decline to Level 2 or Level 3. Therefore, it is prudent for the City to include an annual contingency amount to account for potential additional monitoring and maintenance costs associated with a decline in a complex's management level.

To determine an appropriate annual contingency, it is assumed that, on average each year, either two average-sized complexes will be at Level 2 *or* one average-sized complex will be at Level 3. To estimate the contingency amount, the average Level 2 and Level 3 costs were determined using the average number of vernal pools with focal plant species (13 pools) and shrimp species (three pools) for each complex within the Preserve. The average annual cost associated with this assumption is approximately \$43,000. This equates to approximately 16% of the City's annual ongoing Level 1 monitoring and management costs for the Preserve (\$261,352, refer to Table 3-2). Therefore, a 16% annual contingency is appropriate to account for additional costs associated with complexes declining from Level 1.

Site conditions and monitoring and management requirements will vary among sites and between years depending on a variety of factors, such as rainfall patterns, changes to the surrounding environment, and success of management techniques. Estimated costs are averages and may

fluctuate between years of Project implementation. It is recommended that the City establish a funding mechanism that allows for rollover of unexpended Project funds (including the contingency) for use in future years.

3.1.4 Changed Circumstances

Separate from the contingency, additional costs may be associated with “changed circumstances,” that is, unforeseen circumstances that necessitate additional monitoring and management beyond what is identified in the VPMMP. Based on guidance from USFWS, two specific categories of changed circumstances are included in this cost analysis, as shown in Table 3-4. Cost assumptions are summarized, including average annual cost and total cost for the 36-year life of the Project. More detail is provided in Table A-11 of Attachment A.

**Table 3-4
Cost Assumptions for Changed Circumstances**

Category	Time-Frame for Implementation	Average Annual Cost	Life of VPHCP Permit (36 years)
Post-Fire Management	Once every 10 years	\$86,958*	\$3,130,483
Enhanced Fairy Shrimp Management	Annual	\$50,877	\$1,831,569

*Although post-fire management costs are assumed to be incurred once every 10 years (see Table A-11), an average annual cost is extrapolated for cost estimating purposes.

While the likelihood of occurrence and magnitude of subsequent effects of these circumstances are highly unknown, an estimated level of effort (and associated costs) is provided for consideration. Activities and assumptions associated with the changed circumstances categories are discussed below.

Post-Fire Management

For this cost analysis, it is assumed that a catastrophic fire will burn two average-size complexes (50 vernal pools) once every 10 years. Burned complexes will require limited Level 3 management and monitoring to recover (5 years). Management activities to restore burned complexes will involve general maintenance (trash removal, access control, etc.); weed control in vernal pools and the upland watershed; and seed collection, bulking, and dispersal. Monitoring will involve quantitative observations and Level 3 quantitative monitoring for focal plant species to monitor re-seeding success for all vernal pools in a complex and focal shrimp species pools

(based on pre-fire conditions). It is assumed that, following 5 years of post-fire restoration, a burned complex will be elevated to Level 1 monitoring and management.

Enhanced Fairy Shrimp Management

Fairy shrimp (San Diego or Riverside) population decline is another unforeseen circumstance that may arise due to possible hybridization with versatile fairy shrimp or other yet-to-be determined causes. It is possible that, based on direction from USFWS, the City may be required to implement an enhanced level of effort for management of San Diego and/or Riverside fairy shrimp should a population decline occur. In a good-faith effort to address potential enhanced fairy shrimp management, a cost estimate was developed based on a possible fairy shrimp cyst bulking program. A cyst bank bulking inoculation program could potentially be implemented to address fairy shrimp population issues. Fairy shrimp cyst bank bulking is experimental in design and implementation, and should only be conducted upon approval by USFWS and under the direct supervision of a qualified biologist with permits for handling endangered fairy shrimp species. The guidelines discussed below should be considered.

To implement a cyst banking/inoculation program, cyst-rich soil could be collected from pools known to be occupied by San Diego or Riverside fairy shrimp (and ideally free of versatile fairy shrimp). Soil would be taken to a lab, placed in artificial basins (plastic pools or tubes), and inundated for at least 4 weeks to hatch the fairy shrimp and other crustacean species. A reverse osmosis system would be used to remove minerals and chemicals (chlorine) from the water.

Mature fairy shrimp and other crustacean species would be identified and placed in smaller containers for egg and cyst collection. It is difficult to identify the species of adult male fairy shrimp without the use of magnification, which usually requires the shrimp to be euthanized before identification. However, females can be identified accurately without magnification. To ensure that San Diego and Riverside fairy shrimp are the only shrimp species being collected, only adult females that have bred and developed cyst sacs would be placed in the collection containers.

Fairy shrimp and other crustacean species would drop their eggs and cysts into a sterile medium in the collection containers. Once the adult crustacean species reproduce and completed their life cycle, the collection containers would be dried so that the sand rich with eggs and cysts can be collected and stored.

Soil rich with San Diego and/or Riverside fairy shrimp cysts could be used to inoculate pools and enhance or reestablish populations. Pools could also be saturated with San Diego and/or

Riverside fairy shrimp cysts to possibly outcompete versatile fairy shrimp and prevent hybridization. These methods have not been tested, and would only be conducted under the direction and supervision of USFWS.

3.2 ADDITIONAL COSTS FOR ALTERNATIVE 2 – EXPANDED CONSERVATION

The additional cost (one-time, annual, and total) associated with VPMMP implementation under Alternative 2 (for both recommended and required monitoring and management activities) is summarized below in Table 3-5. Table 3-5 only includes complexes under Alternative 2 that have additional vernal pools occupied with plant and/or shrimp focal species (Expanded Conservation) compared to the Project, because additional monitoring and management costs are tied directly to the number of focal species pools (not the total number of vernal pools). Complexes under Alternative 2 that do not have additional focal species pools are not included. Refer to TWP 2 for a complete list of vernal pools covered under Alternative 2.

The one-time costs for implementing the VPMMP under Alternative 2 is \$29,601 greater than compared to the Project. The estimated total annual cost for implementing the VPMMP under Alternative 2 is \$2,339 greater than for the Project. The total additional cost for the life of the Project (36 years) would be \$106,410 greater than for the Project. This is because Alternative 2 includes 12 additional vernal pools with focal species compared to the Project: four with plants and eight with fairy shrimp. Alternative 2 covers the same 58 vernal complexes as the Project. Note that the only additional focal species pools on City-controlled land are in complexes H 1-10, 13–15, 18–26 (Rhodes), and I 12 (Pueblo Lands); therefore, the City would only be responsible for additional costs associated with those pools for Alternative 2. The additional focal species pools on complexes H 1–10, 13–15, 18–26 (Del Mar Mesa State/Federal), J 13 E, and J 13 S are on private, federal, or state land (shown in grey in Table 3-5).

Table 3-5
Additional Annual Costs Associated with VPMMP Implementation for Alternative 2

Complex ID	Name	Additional Pools with Focal Plant Species	Additional Pools with Focal Shrimp Species	VPMMP Required Monitoring/ Management Level¹	Additional One-Time Cost for VPMMP Required Monitoring/ Management	Additional Annual Cost for VPMMP Level 1 Monitoring/ Management	Additional Total Cost for Alternative 2 (36 years)
H 1–10,	Rhodes	0	3	SSMP	\$4,798	\$860	\$31,458
13–15,	Del Mar Mesa	2	2	SSMP	\$24,803	\$619	\$43,992
18–26	(State/ Federal)						
I 12	Pueblo Lands	0	3	Level 1	N/A	\$860	\$30,960
J 13 E	South Otay J 13 East	1	0	None	\$0	\$0	\$0
J 13 S	South Otay J 13 South	1	0	None	\$0	\$0	\$0
Total Additional Cost		4	8	-	\$29,601	\$2,339	\$106,410
City Additional Cost		0	6		\$4,798	\$1,720	\$62,418

Note: The grey rows indicate vernal pools on lands not under City control. Only additional focal species pools are listed in this table. Refer to TWP 2 for a complete list of vernal pools in Alternative 2.

¹ Required and recommended VPMMP monitoring and management levels are defined in Table A-5 of Attachment A. SSMP = Site-Specific Management Plan, equivalent to Level 3 monitoring and management costs (5-year period).

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CHAPTER 4

REFERENCES

- AECOM. 2011. Draft Technical White Paper 2: Assessment of Focal Species Conservation for the City of San Diego Vernal Pool Habitat Conservation Plan. November.
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ATTACHMENT A

COST EVALUATION

Table A-1: Level 1 Monitoring and Management Costs

Table A-2: Level 2 Monitoring and Management Costs

Table A-3: Level 3 Monitoring and Management Costs

Table A-4: Other One-Time (Mandatory) and Potential As-Needed (Optional) Costs for VPHCP Preserve Monitoring and Management

Table A-5: City of San Diego VPHCP Preserve Monitoring and Management Comprehensive Cost Estimate by Complex for the Project

Table A-6: Summary of One-Time Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)

Table A-7: Summary of Annual Ongoing Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)

Table A-8: Summary of Total Costs for VPHCP Preserve Monitoring and Management by Complex for the 36-Year Life of the Project (2012 Dollars)

Table A-9: Weed Control Cost Estimate Detail

Table A-10: City and Consultant Staff 2012 Rates

Table A-11: Cost Estimate for Changed Circumstances

Table A-12: Fence and Sign Installation Cost Assumptions

Table A-1: Level 1 Monitoring and Management Costs

Task	Assumptions	Staff	Title	Loaded Rate	Hours	Unit	Timing	Annual Cost per Unit
MONITORING LEVEL 1								
Qualitative Visits	1.5 hour per complex, including travel time	City	Bio III	\$91	1.5	Complex	Annual	\$136
Quantitative Floral Focal Species Surveys	0.25 hour per pool; survey 10% of pools with each focal species; if complex has <10 pools for each focal species, survey at least 1 pool for each focal species known to occur	City	Bio III	\$91	0.25	Pool (subsample)	Annual	\$23
Quantitative Shrimp Focal Shrimp Species Surveys	Dry season shrimp cyst sampling for pools with shrimp, up to 10 pools or 5% of pools, whichever is greater; sampling once every 3 years; includes genetic lab time for analyzing shrimp	Consultant	n/a	\$860 per pool	n/a	Pool (subsample)	Once every 3 years	\$287
Ponding Verification	4.5 hours per complex (includes 3 visits during wet season)	City	Bio III	\$91	4.5	Complex	Annual	\$409
MANAGEMENT LEVEL 1								
Patrol/Enforcement	Patrol and enforcement of site access throughout the year (average once per month, 1.5 hrs per visit including travel time)	City	Ranger	\$62	1.5	Complex	Average Monthly	\$1,110
Trash and Debris Removal	Performed in conjunction with other visits	City	GMM or Ranger ¹	\$68	16	Complex	Annual	\$1,091
Access Control Maintenance	Repair and maintenance of previously installed access control (e.g., fencing and signs)	City	GMM or Ranger+ Fence/Sign Cost	\$68	8	Complex	Annual	\$646
Edge Effect Repair	Irrigation control, erosion control, etc.	City	GMM or Ranger ¹	\$68	4	Complex	Annual	\$273
General Weed Control Level 1	Two visits per spring (2 staff) for general upland watershed area and non-focal species vernal pools	City	PA	\$60	32	Complex	Annual	\$1,932
Focal Vernal Pool Weed Control Level 1	Two visits per spring (1 staff) of targeted control of invasives in vernal pools with focal species	City	PA + Herbicide	\$67	16	Complex	Annual	\$1,066
Maintenance Oversight	Average of two 2 hour oversight visits/field coordination efforts per year	City	Snr Plnr	\$92	4	Complex	Annual	\$369

Notes: Level 1 activities apply to pools with focal species unless otherwise noted. Rates are rounded and detailed in Table A-7.

¹ For cost estimating purposes, the City GMM and Ranger rates are averaged

Summary Costs:	
Annual Cost for Complex-Wide Activities	\$7,032
Annual Cost for Each Floral Focal Species Pool in Subsample	\$23
Annual Cost for Each Shrimp Focal Species Pool in Subsample	\$287

Table A-2: Level 2 Monitoring and Management Costs

Task	Assumptions	Staff	Title	Loaded Rate	Hours	Unit	Timing	Annual Cost per Unit
MONITORING LEVEL 2								
Qualitative Visits	1.5 hour per complex, including travel time	City	Bio III	\$91	1.5	Complex	Annual	\$136
Quantitative Floral Focal Species Surveys	0.25 hour per pool. Survey all pools with focal species	City	Bio III	\$91	0.25	Pool	Annual	\$23
Quantitative Shrimp Focal Shrimp Species Surveys	Dry season shrimp cyst sampling for pools with shrimp, up to 10 pools or 10% of pools, whichever is greater; sampling once every 3 years; includes genetic lab time for analyzing shrimp	Consultant	n/a	\$860 per pool	n/a	Pool (subsample)	Once every 3 years	\$287
Ponding Verification	4.5 hours per complex (includes 3 visits during wet season)	City	Bio III	\$91	4.5	Complex	Annual	\$409
MANAGEMENT LEVEL 2								
Trash and Debris Removal	Performed in conjunction with other visits	City	GMM or Ranger ¹	\$68	16	Complex	Annual	\$1,091
Access Control Maintenance	Repair and maintenance of previously installed access control (e.g., fencing and signs)	City	GMM or Ranger + Fence/Sign	\$68	8	Complex	Annual	\$746
Edge Effect Repair	Irrigation control, erosion control, etc.	City	GMM or Ranger ¹	\$68	4	Complex	Annual	\$273
Maintenance Oversight	Assume average of 16 hours per complex annually (4 visits)	Consultant	Snr Bio	\$171	16	Complex	Annual	\$2,742
Dethatching	One time in pools with focal species and 20-foot buffer	Consultant	Crew	n/a	n/a	Pool	Annual	\$277
General Weed Control Level 2	Three visits per spring (2 staff) for general upland watershed area and non-focal species vernal pools	Consultant	Crew + Herbicide	\$66	48	Complex	Annual	\$3,180
Focal Vernal Pool Weed Control Level 2	Two visits per spring (4 staff) and 20-foot buffer around focal species pools only	Consultant	Crew	n/a	n/a	Pool	Annual	\$231
Seed Collection	Hand collection from pools with focal species	Consultant	Bio I	\$99	0.5	Pool	Annual	\$49
Seed Bulking	One greenhouse generation; 50 plants per pool with focal species	Consultant	n/a	\$7.50 per plant	n/a	Pool	Annual	\$375
Seed Dispersal	Hand broadcast in pools with focal species	Consultant	Crew	\$60	0.25	Pool	Annual	\$15
Shrimp Cyst Soil Collection	Performed by permitted biologist	Consultant	Bio I	\$99	0.5	Pool	Annual	\$49
Shrimp Cyst Soil Dispersal	Performed by permitted biologist	Consultant	Bio I	\$99	0.25	Pool	Annual	\$25
Topographic Repair	10 pools per day, including 8 hrs operator plus 8 hrs senior biologist, including maximum depth survey	Consultant	Crew	\$60	8	Pool	Annual	\$98
			Snr Bio	\$171	8	Pool	Annual	\$137

Notes: Level 2 activities apply to pools with focal species unless otherwise noted. Rates are rounded and detailed in Table A-7.

Summary Costs:	
Annual Cost for Complex-Wide Activities	\$8,577
Annual Cost for Each Floral Focal Species Pool in Subsample	\$970
Annual Cost for Each Shrimp Focal Species Pool in Subsample	\$361
Topographic Repair	\$235

Table A-3: Level 3 Monitoring and Management Costs

Task	Assumptions	Staff	Title	Loaded Rate	Hours	Unit	Timing	Annual Cost per Unit
MONITORING LEVEL 3								
Qualitative Visits	1.5 hour per complex, including travel time	Consultant	Bio I	\$99	1.5	Complex	Annual	\$148
Quantitative Floral Focal Species Surveys	0.25 hour per pool; survey all pools with focal species	Consultant	Bio I	\$99	0.25	Pool	Annual	\$25
Quantitative Shrimp Focal Shrimp Species Surveys	Dry season shrimp cyst sampling for pools with shrimp, up to 10 pools or 20% of pools, whichever is greater; sampling once every 3 years; includes genetic lab time for analyzing shrimp	Consultant	n/a	\$860 per pool	n/a	Pool (subsample)	Once every 3 years	\$172
Ponding Verification	4.5 hours per complex (includes 3 visits during wet season)	Consultant	Bio I	\$99	4.5	Complex	Annual	\$444
MANAGEMENT LEVEL 3								
Trash and Debris Removal	Performed in conjunction with other visits	City	GMM or Ranger ¹	\$68	16	Complex	Annual	\$1,091
Access Control Maintenance	Repair and maintenance of previously installed access control (e.g., fencing and signs)	City	GMM or Ranger + Fence/Sign Cost	\$68	8	Complex	Annual	\$746
Edge Effect Repair	Irrigation control, erosion control, etc.	City	GMM or Ranger ¹	\$68	4	Complex	Annual	\$273
Maintenance Oversight	Assume 32 hours per complex annually (8 visits)	Consultant	Snr Bio	\$171	32	Complex	Annual	\$5,483
Dethatching	One time in pools with focal species and 35-foot buffer	Consultant	Crew	\$60	n/a	Pool	Annual	\$558
General Weed Control	Four visits per spring (2 staff) in general upland watershed and non-focal species vernal pools	Consultant	Crew + Herbicide	\$66	64	Complex	Annual	\$4,240
Focal Vernal Pool Weed Control Level 3	Four visits per spring (4 staff) and 35-foot buffer around pools with focal species only	Consultant	Crew	\$60	n/a	Pool	Annual	\$744
Seed Collection	Hand collection from pools with focal species	Consultant	Bio I	\$99	1	Pool	Annual	\$99
Seed Bulking	One greenhouse generation; 50 plants per pool with focal species	Consultant	n/a	\$7.50 per plant	n/a	Pool	Annual	\$375
Seed Dispersal	Hand broadcast in pools with focal species	Consultant	Crew	\$60	0.5	Pool	Annual	\$30
Container Plant Installation	Plants are directly planted into the site	Consultant	Crew	\$60	4	Pool	Annual	\$240
Container Plant Care	Includes 3 visits for watering (0.5 hour each), does not include water cost	Consultant	Crew	\$60	1.5	Pool	Annual	\$90
Shrimp Cyst Soil Collection	Performed by permitted biologist	Consultant	Bio I	\$99	1	Pool	Annual	\$99
Shrimp Cyst Soil Dispersal	Performed by permitted biologist	Consultant	Bio I	\$99	0.5	Pool	Annual	\$49
Topographic Repair	8 pools per day, including 8 hrs operator plus 8 hrs senior biologist, including maximum depth survey	Consultant	Crew	\$60	8	Pool	Annual	\$123
			Snr Bio	\$171	8	Pool	Annual	\$171

Notes: Level 3 activities apply to pools with focal species unless otherwise noted. Rates are rounded and detailed in Table A-7.

Summary Costs:	
Annual Cost for Complex-Wide Activities	\$12,424
Annual Cost for Each Floral Focal Species Pool in Subsample	\$2,160
Annual Cost for Each Shrimp Focal Species Pool in Subsample	\$320
Topographic Repair	\$294

Table A-4: Other One-Time (Mandatory) and Potential As-Needed (Optional) Costs for VPHCP Preserve Monitoring and Management

Task	Assumptions	Staff	Title	Loaded Rate	Hrs	Unit	Timing	Estimated Cost or Range of Costs
ONE-TIME MANDATORY COSTS (INCLUDED IN TABLE A-5)								
HGM Baseline Survey (City Lands)	Assume all pools in the VPHCP Preserve on City controlled lands (1,487 pools) will be surveyed within a 5 year timeframe. Data collection for Level 2 and 3 pools will be funded via the VPHCP, Level 1 pools will be funded via outside funding (e.g., grant)	Consultant	Bio I	\$99	0.5	Per Pool	One-Time	\$73,287
HGM Baseline Survey (Other Ownership)	Assume all pools in the VPHCP Preserve on privately owned/controlled lands (1,374 pools) will be surveyed within a 5 year timeframe	Consultant	Bio I	\$99	0.5	Per Pool	One-Time	\$67,718
Installing Fencing/Signage	Fencing and signage will be installed at certain complexes that do not have existing access control and require fencing/signs based on City direction (as detailed in Table A-12). Costs include materials plus City staff labor for installation.	City	GMM	\$75	N/A	Average Fence/Sign Installation Cost plus Labor per Linear Foot	One-Time	\$10,291
POTENTIAL AS-NEEDED OPTIONAL COSTS TO CONSIDER (NOT INCLUDED IN TABLE A-5)								
Develop Tracking and Reporting Database (Optional)	Includes cost to develop and deploy database and train City staff. Does not include annual maintenance costs	Consultant	Various	N/A	N/A	Database	One-time	\$50,000-\$75,000
Management Level 1								
Topographic Repair Level 1	Minor as-needed repairs with hand tools	City	GMM	\$75	16	Complex	Annual	\$1,196
Management Level 2								
Detailed Restoration Plan	For internal use by City and Consultant staff to guide specific restoration activities; prepared at the discretion of the City	Consultant	Various	N/A	N/A	Per Plan	One-time	\$5,000 (1-20 pools)/ \$7,500 (21-50 pools)/ \$10,000 (51-100 pools)
Detailed Topographic Plan	Includes a detailed micro-topographic map to direct vernal pool restoration; prepared at the discretion of the City	Consultant	Various	N/A	N/A	Per Plan	One-time	\$3,500 (1-20 pools)/ \$7,500 (21-50 pools)/ \$10,000 (50+ pools)
Management Level 3								
Detailed Restoration Plan	For internal use by City and Consultant staff to guide specific restoration activities; prepared at the discretion of the City	Consultant	Various	N/A	N/A	Per Plan	One-time	\$5,000 (1-20 pools)/ \$7,500 (21-50 pools)/ \$10,000 (51-100 pools)
Detailed Topographic Plan	For internal use by City and Consultant staff, includes a detailed micro-topographic map to direct vernal pool restoration; prepared at the discretion of the City	Consultant	Various	N/A	N/A	Per Plan	One-time	\$3,500 (1-20 pools)/ \$7,500 (21-50 pools)/ \$10,000 (50+ pools)

Notes: Rates are detailed in Table A-7.

Table A-5 City of San Diego VPHCP Preserve Monitoring and Management Comprehensive Cost Estimate by Complex for the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Plant Focal Species Pools Subsample (Level 1)	Pools with Plant Focal Species (Level 2)	Pools with Plant Focal Species (Level 3)	Total Pools with Shrimp Focal Species	Shrimp Focal Species Pool Subsample (Level 1)	Shrimp Focal Species Pool Subsample (Level 2)	Shrimp Focal Species Pool Subsample (Level 3)	% City Controlled Pools	Total One-Time Fence/Sign Installation Cost	City One-Time Fence/Sign Installation Cost	Total Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	City Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	Required VPMMP Mngmt & Monitoring Level	Total One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	City One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	Recommended VPMMP Mngmt & Monitoring Level	Total One-Time Cost for Recommended VPMMP Mngmt & Monitoring Level (\$)	City One-Time Cost for Recommended VPMMP Mngmt & Monitoring Level (\$)	Total Cost for VPMMP Implementation (36 Years)	City Cost for Required VPMMP Implementation (36 Years)
B 11	Mesa Norte	North	Private	16	2	16	16	24	10	10	10	0	0	0	9,945	0	Level 1	0	0	None	0	0	358,006	0
B 5	Tierra Alta	North	Private	0	0	0	0	0	0	0	0	0	1,915	0	7,032	0	SSMP	62,122	0	None	0	0	280,129	0
B 6	Lopez Ridge (CDFG)	North	State	1	1	1	1	0	0	0	0	0	0	0	7,055	0	Level 1	0	0	None	0	0	253,988	0
B 7-8	Crescent Heights	North	City	1	1	1	1	0	0	0	0	100	0	0	7,055	7,055	Level 1	0	0	SSA	29,347	29,347	253,988	253,988
	Lopez Ridge (City)	North	City	10	2	10	10	2	2	2	2	100	0	0	7,651	7,651	Level 1	0	0	SSA	60,527	60,527	275,446	275,446
C 10-16	Winterwood	North	School District	27	4	27	27	2	2	2	2	0	0	0	7,697	0	SSMP	379,026	0	None	0	0	617,625	0
C 17-18	Fieldstone	North	Private	8	1	8	8	0	0	0	0	0	0	0	7,055	0	None ₂	0	0	Level 1	23,090	0	0	0
C 27	Mira Mesa Market Center	North	Private	1	1	1	1	1	1	1	1	0	0	0	7,342	0	None	0	0	None	0	0	0	0
D 5-8	Parkdale Carroll Canyon	North	City	0	0	0	0	0	0	0	0	100	0	0	7,032	7,032	Level 1	0	0	None	0	0	253,169	253,169
	Carroll Canyon	North	City	76	11	76	76	5	5	5	5	100	0	0	8,716	8,716	Level 1	0	0	None	0	0	313,773	313,773
F 16-17	Menlo KM Parcel	Central	Private	0	0	0	0	1	1	1	1	0	0	0	7,319	0	None ₁	0	0	Level 2	27,518	0	0	0
H 1-10, 13-15,18, 23, 24-26	Del Mar Mesa (State/Federal)	North	State/Federal	154	18	154	154	10	10	10	10	0	0	0	10,308	0	SSMP	1,778,424	0	None	0	0	2,097,984	0
	Del Mar Mesa (Private)	North	Private	2	1	2	2	1	1	1	1	0	13,752	0	7,342	0	SSMP	88,265	0	None	0	0	315,863	0
	Del Mar Mesa (City/County)	North	City and County	64	7	64	64	8	8	8	8	84	31,384	26,489	9,485	8,006	SSMP	803,005	406,659	None	0	0	1,097,039	925,941
	Rhodes	North	Private	12	2	12	12	4	4	4	4	0	0	0	8,225	0	SSMP (pending approval)	212,841	0	None	0	0	467,805	0
H 17	Shaw Lorenz	North	Private	0	0	0	0	1	1	1	1	0	0	0	7,319	0	SSMP	65,191	0	None	0	0	292,084	0
H 33	East Ocean Air Drive	North	Private	2	1	2	2	0	0	0	0	0	4,704	0	7,055	0	None ₂	0	0	Level 2	31,553	0	0	0
H 38	Carmel Mountain	North	City	0	0	0	0	2	2	2	2	100	0	0	7,606	7,606	SSMP	68,260	40,956	Level 2	29,305	29,305	304,040	304,040
H 39	Greystone Torrey Highlands	North	City	6	2	6	6	0	0	0	0	100	0	0	7,078	7,078	Level 1	0	0	None	0	0	254,806	254,806
I 1	Arjons	North	Private	25	4	25	25	1	1	1	1	0	0	0	7,410	0	None ₂	0	0	None (Legal access and easement)	0	0	0	0
I12	Pueblo Lands	North	City	0	0	0	0	2	2	2	2	100	0	0	7,606	7,606	Level 1	0	0	Level 3	68,260	68,260	273,809	273,809
I 6 B	Ford Leasing (Bob Baker)	North	Private	1	1	1	1	3	3	3	3	0	0	0	7,915	0	None ₂	0	0	Level 2	32,593	0	0	0
I 6 C	Facilities Development (Eastgate Miramar Associates)	North	Private	11	2	11	11	6	6	6	6	0	12,197	0	8,798	0	None ₂	0	0	Level 2	67,765	0	0	0
J 11 E	Slump Block Pools	South	Private	0	0	0	0	0	0	0	0	0	12,146	0	7,032	0	None ₁	0	0	Level 3	62,122	0	0	0
J 11 W	J 11 West	South	Private	0	0	0	0	1	1	1	1	0	21,750	0	7,319	0	None ₁	0	0	Level 3	65,191	0	0	0
J 12	J 12	South	Private	0	0	0	0	0	0	0	0	0	14,575	0	7,032	0	None ₁	0	0	Level 3	62,122	0	0	0
J 13 E	South Otay J 13 East	South	Private	0	0	0	0	0	0	0	0	0	16,963	0	7,032	0	None ₁	0	0	Level 3	62,122	0	0	0
J 13 N	South Otay 1 acre (private)	South	Private	0	0	0	0	0	0	0	0	0	25,877	0	7,032	0	None ₁	0	0	Level 3	62,122	0	0	0
	South Otay 1 acre (City)	South	City	3	3	3	3	0	0	0	0	100	0	0	7,101	7,101	None	0	0	Level 3	98,938	98,938	0	0
J 13 S	South Otay J 13 South	South	Private	6	1	6	6	0	0	0	0	0	58,867	0	7,055	0	None ₁	0	0	Level 3	135,753	0	0	0
	Bachman	South	Private	0	0	0	0	0	0	0	0	0	2,090	0	7,032	0	None ₁	0	0	Level 3	62,122	0	0	0
J 14	Anderprises (Caltrans)	South	State	2	2	2	2	7	7	7	7	0	55,182	0	9,085	0	SSMP	108,146	0	None	0	0	389,769	0
	Anderprises (City)	South	City	0	0	0	0	0	0	0	0	100	2,326	2,326	7,032	7,032	None	0	0	None	0	0	253,169	253,169
	Cal Terraces (South)	South	City	63	14	63	63	36	10	10	10	100	0	0	10,217	10,217	Level 1	0	0	None	0	0	367,828	367,828
	Handler	South	Private	0	0	0	0	0	0	0	0	0	0	0	7,032	0	SSMP	62,122	0	None	0	0	280,129	0
	Bachman	South	Private	0	0	0	0	0	0	0	0	0	6,598	0	7,032	0	Level 1	0	0	Level 3	62,122	0	253,169	0
J 15	Arnie's Point	South	Federal	62	10	62	62	57	10	10	11	0	2,265	0	10,127	0	SSMP	764,159	0	None	0	0	1,078,081	0
J 16-18	Goat Mesa (Federal)	South	Federal	0	0	0	0	0	0	0	0	0	0	0	7,032	0	None	0	0	None	0	0	0	0
	Goat Mesa (Private)	South	Private	0	0	0	0	0	0	0	0	0	10,118	0	7,032	0	None ₁	0	0	Level 2	25,731	0	0	0
	Goat Mesa (City)	South	City	4	1	4	4	0	0	0	0	100	23,149	23,149	7,055	7,055	Level 2	38,784	38,784	None	0	0	271,606	271,606
	Wruck Canyon	South	City	0	0	0	0	0	0	0	0	100	0	0	7,032	7,032	Level 2	25,731	25,731	None	0	0	257,803	257,803
J 2	Cal Terraces (North), Otay Mesa Road Parcels	South	City	219	70	219	219	216	11	22	43	100	0	0	11,720	11,720	Level 1	0	0	None	0	0	421,921	421,921
	Clayton Parcel	South	City	1	1	1	1	0	0	0	0	100	65,403	65,403	7,055	7,055	Level 1	0	0	Level 3	74,394	74,394	253,988	253,988
	St. Jerome's	South	Private	0	0	0	0	0	0	0	0	0	16,778	0	7,032	0	None ₁	0	0	Level 3	62,122	0	0	0
J 20-21	La Media ITS	South	Private	0	0	0	0	6	6	6	6	0	8,358	0	8,752	0	None ₁	0	0	Level 3	80,534	0	0	0
J 21	La Media Swale South	South	Private	0	0	0	0	0	0	0	0	0	13,958	0	7,032	0	None ₁	0	0	Level 3	62,122	0	0	0
J 27	Empire Center	South	Private	9	1	9	9	0	0	0	0	0	0	0	7,055	0	None ₂	0	0	Level 1	21,166	0	0	0
J 28 E	La Media Swale North	South	Private	0	0	0	0	0	0	0	0	0	54,328	0	7,032	0	None ₁	0	0	Level 3	62,122	0	0	0
J 29	Lonestar W (Caltrans)	South	State	9	1	9	9	1	1	1	1	0	0	0	7,342	0	SSMP	175,636	0	None	0	0	403,235	0
J 30	Lonestar E (Caltrans)	South	State	0	0	0	0	70	10	10	14	0	0	0	9,899	0	SSMP	121,244	0	None	0	0	428,117	0
	Lonestar E (Private)	South	Private	33	4	33	33	0	0	0	0	0	0	0	7,123	0	SSMP	440,642	0	Level 2	132,361	0	661,468	0
J 31	Dennery West	South	State	0	0	0	0	38	10	10	10	0	32,753	0	9,899	0	SSMP	78,115	0	None	0	0	384,989	0
	Hidden Trails **	South	City	0	0	0	0	1	1	1	1	100	0	0	7,319	7,319	Level 2	28,224	28,224	None	0	0	269,755	269,755
J 32	West Otay A	South	State	15	3	15	15	9	9	9	9	0	11,796	0	9,681	0	SSMP	253,245	0	None	0	0	553,346	0
	West Otay B	South	City	0	0	0	0	0	0	0	0	100	0	0	7,032	7,032	SSMP	62,122	37,273	None	0	0	280,129	280,129

Table A-5 City of San Diego VPHCP Preserve Monitoring and Management Comprehensive Cost Estimate by Complex for the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Plant Focal Species Pools Subsample (Level 1)	Pools with Plant Focal Species (Level 2)	Pools with Plant Focal Species (Level 3)	Total Pools with Shrimp Focal Species	Shrimp Focal Species Pool Subsample (Level 1)	Shrimp Focal Species Pool Subsample (Level 2)	Shrimp Focal Species Pool Subsample (Level 3)	% City Controlled Pools	Total One-Time Fence/Sign Installation Cost	City One-Time Fence/Sign Installation Cost	Total Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	City Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	Required VPMMP Mngmt & Monitoring Level	Total One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	City One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	Recommended VPMMP Mngmt & Monitoring Level	Total One-Time Cost for Recommended VPMMP Mngmt & Monitoring Level (\$)	City One-Time Cost for Recommended VPMMP Mngmt & Monitoring Level (\$)	Total Cost for VPMMP Implementation (36 Years)	City Cost for Required VPMMP Implementation (36 Years)
	West Otay C	South	City	1	1	1	1	0	0	0	0	100	9,933	9,933	7,055	7,055	Level 1	0	0	Level 2	29,347	29,347	253,988	253,988
J 33	Sweetwater High School	South	School District	7	3	7	7	8	8	8	8	0	21,636	0	9,394	0	SSMP	150,534	0	None	0	0	441,748	0
J 34	Bachman	South	Private	0	0	0	0	0	0	0	0	0	45,208	0	7,032	0	None ₁	0	0	Level 3	62,122	0	0	0
	Candlelight	South	Private	0	0	0	0	1	1	1	1	0	0	0	7,319	0	SSMP	63,722	0	None	0	0	290,615	0
J 35	Brown Field	South	City	0	0	0	0	0	0	0	0	100	29,192	29,192	7,032	7,032	Level 3	62,122	37,273	None	0	0	280,129	280,129
J 36	Southview	South	Private	0	0	0	0	12	10	10	10	0	14,061	0	9,899	0	None ₁	0	0	Level 3	95,746	0	0	0
J 4	Robinhood Ridge	South	City	50	8	50	50	41	10	10	10	100	0	0	10,081	10,081	Level 1	0	0	Level 2	189,133	189,133	362,917	362,917
	California Crossing	South	Private	0	0	0	0	5	5	5	5	0	0	0	8,466	0	None (reporting)	0	0	Level 3	70,119	0	0	0
K 5	Otay Lakes	Central	City	46	6	46	46	6	6	6	6	100	14,235	14,235	8,889	8,889	Level 1	0	0	None	0	0	320,000	320,000
KK 2	Pasatiempo	Central	City	0	0	0	0	0	0	0	0	100	0	0	7,032	7,032	None	0	0	None	0	0	0	0
MM 1	Marron Valley	South	City	0	0	0	0	5	5	5	5	100	0	0	8,466	8,466	Level 2	32,551	32,551	None	0	0	311,923	311,923
N 1-4	Teledyne Ryan	Central	Private	1	1	1	1	11	10	10	10	0	0	0	9,922	0	None ₁	0	0	Level 2	46,512	0	0	0
N 5-6	Montgomery Field	Central	City	129	13	129	129	10	10	10	10	100	0	0	10,195	10,195	Level 1	0	0	None	0	0	367,010	367,010
N 7	Serra Mesa Library	Central	City	0	0	0	0	0	0	0	0	100	0	0	7,032	7,032	Level 1	0	0	SSA	25,000	25,000	253,169	253,169
N 8	General Dynamics **	Central	City	20	3	20	20	6	6	6	6	100	0	0	8,821	8,821	Level 1	0	0	None	0	0	317,545	317,545
NC	Li Collins	North	Private	0	0	0	0	0	0	0	0	0	0	0	7,032	0	None	0	0	SSA	25,731	0	0	0
	Kelton	South	City	0	0	0	0	0	0	0	0	100	3,088	3,088	7,032	7,032	None	0	0	SSA	No actions identified	0	0	0
OO	Salk Institute	North	Private	0	0	0	0	0	0	0	0	0	0	0	7,032	0	SSMP	62,122	0	SSA	0 (education only)	0	280,129	0
Q2	Mission Trails Regional Park School District	Central	School District	0	0	0	0	0	0	0	0	0	3,088	0	7,032	0	None ₁	0	0	Level 3	62,122	0	0	0
	Mission Trails Regional Park	Central	City	0	0	0	0	6	6	6	6	100	0	0	8,752	8,752	SSMP	79,064	47,439	Level 2	35,748	35,748	350,391	350,391
Q 3	Castlerock	North	Private	0	0	0	0	0	0	0	0	0	17,890	0	7,032	0	SSMP	62,122	0	None	0	0	280,129	0
QQ	Tecolote Canyon	Central	City	0	0	0	0	0	0	0	0	100	0	0	7,032	7,032	None	0	0	None	0	0	0	0
R 1	Proctor Valley	South	City	0	0	0	0	3	3	3	3	100	39,042	39,042	7,892	7,892	Level 1	0	0	None	0	0	284,129	284,129
U15	SANDER	Central	City	1	1	1	1	2	2	2	2	100	60,658	60,658	7,629	7,629	Level 1	0	0	None	0	0	274,628	274,628
U 19	Cubic	Central	Private	3	2	3	3	6	6	6	6	0	0	0	8,798	0	None ₁	0	0	Level 3	111,472	0	0	0
X 5	Nobel Drive	North	City	1	1	1	1	6	6	6	6	100	0	0	8,775	8,775	Level 1	0	0	None	0	0	315,908	315,908
X 7	Nobel Research **	North	City	0	0	0	0	1	1	1	1	100	13,618	13,618	7,319	7,319	Level 1	0	0	Level 1	21,957	21,957	263,489	263,489
Subtotal VPMMP Monitoring and Management Cost															647,336	261,352		6,127,543	694,891		2,338,139	661,957	19,765,905	9,186,398
Data Tracking and Reporting (Bio III 1 day per week annually, City responsibility for all sites)															36,665	36,665							1,319,932	1,319,932
Changed Circumstances (refer to Table A-11 for detail, assumes City is responsible for all costs)															137,931	137,931							4,965,518	4,965,518
Contingency 16% Annually (refer to TWP 5 Section 3.1.3 for details)															43,007	43,007							1,548,246	1,548,246
Total One-Time Fence/Sign Installation Cost (only certain complexes, as detailed in Table A-12)																							790,878	287,134
One-Time Cost for Vernal Pool HGM Baseline Survey (see Table A-4 for detail)																							141,004	73,287
TOTAL COST													790,878	287,134	864,939	478,955		6,127,543	694,891		2,338,139	661,957	28,531,484	17,380,515

= Land not owned by City of San Diego.

Bold

= Land not owned by City of San Diego or under the City of San Diego's land use authority.

SSMP = Site-specific Management Plan, not part of VPMMP. For cost-estimating purposes, Level 3 costs are assumed.

SSA = Site-Specific Action, costs is based on specific actions specified in TWP 3&4 VPMMP Attachment A

None₁ = These sites are privately held and may seek development entitlement in the future. During the development entitlement process the City will ensure the property owner implements the Recommended Management.

None₂ = These site have been developed pursuant to prior approval by City of San Diego. No management was required at that time, nor is any management being required as part of this HCP. As funding becomes available the City may work with the owner to implement the Additional Recommended Management.

* = One-time costs are assumed for a 3-year period for monitoring and management for VPMMP-required Level 2 and 5-years for Level 3. After the initial 3 or 5-years, all complexes are assumed at the annual ongoing Level 1 cost. Sites at Level 1 are NOT included in this column as they are part of the on-going annual costs.

** = Development projects were approved on these three sites after the adoption of the City of San Diego’s Multiple Species Conservation Plan (MSCP). The City was granted a Conservation Easement as a condition of the discretionary land use entitlement. While the ownership is private, the City committed to provide the biological management of these sites as a condition easement pursuant to the requirements of the MSCP.

Note: There are 146 vernal pools that are OUTSIDE the Vernal Pool HCP Preserve and SUBJECT to City Jurisdiction. Those 146 vernal pools are NOT included in this table and are proposed to be lost to development if the City's Vernal Pool HCP is adopted. Therefore no monitoring or management will be implemented by the City for those 146 pools under the HCP.

Table A-6: Summary of One-Time Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total One-Time Fence/Sign Installation Cost	City One-Time Fence/Sign Installation Cost	Required VPMMP Mngmt & Monitoring Level	Total One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	City One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)
B 11	Mesa Norte	North	Private	16	24	0	0	0	Level 1	0	0
B 5	Tierra Alta	North	Private	0	0	0	1,915	0	SSMP	62,122	0
B 6	Lopez Ridge (CDFG)	North	State	1	0	0	0	0	Level 1	0	0
B 7-8	Crescent Heights	North	City	1	0	100	0	0	Level 1	0	0
	Lopez Ridge (City)	North	City	10	2	100	0	0	Level 1	0	0
C 10-16	Winterwood	North	School District	27	2	0	0	0	SSMP	379,026	0
C 17-18	Fieldstone	North	Private	8	0	0	0	0	None ₂	0	0
C 27	Mira Mesa Market Center	North	Private	1	1	0	0	0	None	0	0
D 5-8	Parkdale Carroll Canyon	North	City	0	0	100	0	0	Level 1	0	0
	Carroll Canyon	North	City	76	5	100	0	0	Level 1	0	0
F 16-17	Menlo KM Parcel	Central	Private	0	1	0	0	0	None ₁	0	0
H 1-10, 13-15, 18-23, 24-26	Del Mar Mesa (State/Federal)	North	State/Federal	154	10	0	0	0	SSMP	1,778,424	0
	Del Mar Mesa (Private)	North	Private	2	1	0	13,752	0	SSMP	88,265	0
	Del Mar Mesa (City/County)	North	City and County	64	8	84	31,384	26,489	SSMP	803,005	406,659
	Rhodes	North	Private	12	4	0	0	0	SSMP (pending approval)	212,841	0
H 17	Shaw Lorenz	North	Private	0	1	0	0	0	SSMP	65,191	0
H 33	East Ocean Air Drive	North	Private	2	0	0	4,704	0	None ₂	0	0
H 38	Carmel Mountain	North	City	0	2	100	0	0	SSMP	68,260	40,956
H 39	Greystone Torrey Highlands	North	City	6	0	100	0	0	Level 1	0	0
I 1	Arjons	North	Private	25	1	0	0	0	None ₂	0	0
I12	Pueblo Lands	North	City	0	2	100	0	0	Level 1	0	0
I 6 B	Ford Leasing (Bob Baker)	North	Private	1	3	0	0	0	None ₂	0	0
I 6 C	Facilities Development (Eastgate Miramar Associates)	North	Private	11	6	0	12,197	0	None ₂	0	0
J 11 E	Slump Block Pools	South	Private	0	0	0	12,146	0	None ₁	0	0
J 11 W	J 11 West	South	Private	0	1	0	21,750	0	None ₁	0	0
J 12	J 12	South	Private	0	0	0	14,575	0	None ₁	0	0
J 13 E	South Otay J 13 East	South	Private	0	0	0	16,963	0	None ₁	0	0
J 13 N	South Otay 1 acre (private)	South	Private	0	0	0	25,877	0	None ₁	0	0
	South Otay 1 acre (City)	South	City	3	0	100	0	0	None	0	0

Table A-6: Summary of One-Time Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total One-Time Fence/Sign Installation Cost	City One-Time Fence/Sign Installation Cost	Required VPMMP Mngmt & Monitoring Level	Total One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	City One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)
J 13 S	South Otay J 13 South	South	Private	6	0	0	58,867	0	None ₁	0	0
	Bachman	South	Private	0	0	0	2,090	0	None ₁	0	0
J 14	Anderprises (Caltrans)	South	State	2	7	0	55,182	0	SSMP	108,146	0
	Anderprises (City)	South	City	0	0	100	2,326	2,326	None	0	0
	Cal Terraces (South)	South	City	63	36	100	0	0	Level 1	0	0
	Handler	South	Private	0	0	0	0	0	SSMP	62,122	0
	Bachman	South	Private	0	0	0	6,598	0	Level 1	0	0
J 15	Arnie's Point	South	Federal	62	57	0	2,265	0	SSMP	764,159	0
J 16-18	Goat Mesa (Federal)	South	Federal	0	0	0	0	0	None	0	0
	Goat Mesa (Private)	South	Private	0	0	0	10,118	0	None ₁	0	0
	Goat Mesa (City)	South	City	4	0	100	23,149	23,149	Level 2	38,784	38,784
	Wruck Canyon	South	City	0	0	100	0	0	Level 2	25,731	25,731
J 2	Cal Terraces (North), Otay Mesa Road Parcels	South	City	219	216	100	0	0	Level 1	0	0
	Clayton Parcel	South	City	1	0	100	65,403	65,403	Level 1	0	0
	St. Jerome's	South	Private	0	0	0	16,778	0	None ₁	0	0
J 20-21	La Media ITS	South	Private	0	6	0	8,358	0	None ₁	0	0
J 21	La Media Swale South	South	Private	0	0	0	13,958	0	None ₁	0	0
J 27	Empire Center	South	Private	9	0	0	0	0	None ₂	0	0
J 28 E	La Media Swale North	South	Private	0	0	0	54,328	0	None ₁	0	0
J 29	Lonestar W (Caltrans)	South	State	9	1	0	0	0	SSMP	175,636	0
J 30	Lonestar E (Caltrans)	South	State	0	70	0	0	0	SSMP	121,244	0
	Lonestar E (Private)	South	Private	33	0	0	0	0	SSMP	440,642	0
J 31	Dennery West	South	State	0	38	0	32,753	0	SSMP	78,115	0
	Hidden Trails **	South	City	0	1	100	0	0	Level 2	28,224	28,224
J 32	West Otay A	South	State	15	9	0	11,796	0	SSMP	253,245	0
	West Otay B	South	City	0	0	100	0	0	SSMP	62,122	37,273
	West Otay C	South	City	1	0	100	9,933	9,933	Level 1	0	0
J 33	Sweetwater High School	South	School District	7	8	0	21,636	0	SSMP	150,534	0
J 34	Bachman	South	Private	0	0	0	45,208	0	None ₁	0	0
	Candlelight	South	Private	0	1	0	0	0	SSMP	63,722	0
J 35	Brown Field	South	City	0	0	100	29,192	29,192	Level 3	62,122	37,273
J 36	Southview	South	Private	0	12	0	14,061	0	None ₁	0	0
	Robinhood Ridge	South	City	50	41	100	0	0	Level 1	0	0

Table A-6: Summary of One-Time Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total One-Time Fence/Sign Installation Cost	City One-Time Fence/Sign Installation Cost	Required VPMMP Mngmt & Monitoring Level	Total One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	City One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)
J 4	California Crossing	South	Private	0	5	0	0	0	None (reporting)	0	0
K 5	Otay Lakes	Central	City	46	6	100	14,235	14,235	Level 1	0	0
KK 2	Pasatiempo	Central	City	0	0	100	0	0	None	0	0
MM 1	Marron Valley	South	City	0	5	100	0	0	Level 2	32,551	32,551
N 1-4	Teledyne Ryan	Central	Private	1	11	0	0	0	None ₁	0	0
N 5-6	Montgomery Field	Central	City	129	10	100	0	0	Level 1	0	0
N 7	Serra Mesa Library	Central	City	0	0	100	0	0	Level 1	0	0
N 8	General Dynamics **	Central	City	20	6	100	0	0	Level 1	0	0
NC	Li Collins	North	Private	0	0	0	0	0	None	0	0
	Kelton	South	City	0	0	100	3,088	3,088	None	0	0
OO	Salk Institute	North	Private	0	0	0	0	0	SSMP	62,122	0
Q2	Mission Trails Regional Park School District	Central	School District	0	0	0	3,088	0	None₁	0	0
	Mission Trails Regional Park	Central	City	0	6	100	0	0	SSMP	79,064	47,439
Q 3	Castlerock	North	Private	0	0	0	17,890	0	SSMP	62,122	0
QQ	Tecolote Canyon	Central	City	0	0	100	0	0	None	0	0
R 1	Proctor Valley	South	City	0	3	100	39,042	39,042	Level 1	0	0
U15	SANDER	Central	City	1	2	100	60,658	60,658	Level 1	0	0
U 19	Cubic	Central	Private	3	6	0	0	0	None ₁	0	0
X 5	Nobel Drive	North	City	1	6	100	0	0	Level 1	0	0
X 7	Nobel Research **	North	City	0	1	100	13,618	13,618	Level 1	0	0
Subtotal VPMMP Required Monitoring and Management Cost										6,127,543	694,891
Total One-Time Fence/Sign Installation Cost (only certain complexes, as detailed in Table A-12)										790,878	287,134
One-Time Vernal Pool HGM Baseline Survey (see Table A-4 for detail)										141,004	73,287
TOTAL ONE-TIME COST										7,059,425	1,055,311

= Land not owned by City of San Diego.

Bold

= Land not owned by City of San Diego or under the City of San Diego's land use authority

Table A-7 Summary of Annual Ongoing Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	City Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)
B 11	Mesa Norte	North	Private	16	24	0	9,945	0
B 5	Tierra Alta	North	Private	0	0	0	7,032	0
B 6	Lopez Ridge (CDFG)	North	State	1	0	0	7,055	0
B 7-8	Crescent Heights	North	City	1	0	100	7,055	7,055
	Lopez Ridge (City)	North	City	10	2	100	7,651	7,651
C 10-16	Winterwood	North	School District	27	2	0	7,697	0
C 17-18	Fieldstone	North	Private	8	0	0	7,055	0
C 27	Mira Mesa Market Center	North	Private	1	1	0	7,342	0
D 5-8	Parkdale Carroll Canyon	North	City	0	0	100	7,032	7,032
	Carroll Canyon	North	City	76	5	100	8,716	8,716
F 16-17	Menlo KM Parcel	Central	Private	0	1	0	7,319	0
H 1-10, 13-15, 18-23, 24-26	Del Mar Mesa (State/Federal)	North	State/Federal	154	10	0	10,308	0
	Del Mar Mesa (Private)	North	Private	2	1	0	7,342	0
	Del Mar Mesa (City/County)	North	City and County	64	8	84	9,485	8,006
	Rhodes	North	Private	12	4	0	8,225	0
H 17	Shaw Lorenz	North	Private	0	1	0	7,319	0
H 33	East Ocean Air Drive	North	Private	2	0	0	7,055	0
H 38	Carmel Mountain	North	City	0	2	100	7,606	7,606
H 39	Greystone Torrey Highlands	North	City	6	0	100	7,078	7,078
I 1	Arjons	North	Private	25	1	0	7,410	0
I 12	Pueblo Lands	North	City	0	2	100	7,606	7,606
I 6 B	Ford Leasing (Bob Baker)	North	Private	1	3	0	7,915	0
I 6 C	Facilities Development (Eastgate Miramar Associates)	North	Private	11	6	0	8,798	0
J 11 E	Slump Block Pools	South	Private	0	0	0	7,032	0
J 11 W	J 11 West	South	Private	0	1	0	7,319	0
J 12	J 12	South	Private	0	0	0	7,032	0
J 13 E	South Otay J 13 East	South	Private	0	0	0	7,032	0
J 13 N	South Otay 1 acre (private)	South	Private	0	0	0	7,032	0
	South Otay 1 acre (City)	South	City	3	0	100	7,101	7,101
J 13 S	South Otay J 13 South	South	Private	6	0	0	7,055	0
	Bachman	South	Private	0	0	0	7,032	0
J 14	Anderprises (Caltrans)	South	State	2	7	0	9,085	0
	Anderprises (City)	South	City	0	0	100	7,032	7,032
	Cal Terraces (South)	South	City	63	36	100	10,217	10,217
	Handler	South	Private	0	0	0	7,032	0
	Bachman	South	Private	0	0	0	7,032	0
J 15	Arnie's Point	South	Federal	62	57	0	10,127	0
J 16-18	Goat Mesa (Federal)	South	Federal	0	0	0	7,032	0
	Goat Mesa (Private)	South	Private	0	0	0	7,032	0
	Goat Mesa (City)	South	City	4	0	100	7,055	7,055
	Wruck Canyon	South	City	0	0	100	7,032	7,032
J 2	Cal Terraces (North), Otay Mesa Road Parcels	South	City	219	216	100	11,720	11,720
	Clayton Parcel	South	City	1	0	100	7,055	7,055
	St. Jerome's	South	Private	0	0	0	7,032	0
J 20-21	La Media ITS	South	Private	0	6	0	8,752	0
J 21	La Media Swale South	South	Private	0	0	0	7,032	0
J 27	Empire Center	South	Private	9	0	0	7,055	0
J 28 E	La Media Swale North	South	Private	0	0	0	7,032	0
J 29	Lonestar W (Caltrans)	South	State	9	1	0	7,342	0
J 30	Lonestar E (Caltrans)	South	State	0	70	0	9,899	0
	Lonestar E (Private)	South	Private	33	0	0	7,123	0
J 31	Dennery West	South	State	0	38	0	9,899	0
	Hidden Trails **	South	City	0	1	100	7,319	7,319
J 32	West Otay A	South	State	15	9	0	9,681	0
	West Otay B	South	City	0	0	100	7,032	7,032
	West Otay C	South	City	1	0	100	7,055	7,055
J 33	Sweetwater High School	South	School District	7	8	0	9,394	0

Table A-7 Summary of Annual Ongoing Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	City Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)
J 34	Bachman	South	Private	0	0	0	7,032	0
	Candlelight	South	Private	0	1	0	7,319	0
J 35	Brown Field	South	City	0	0	100	7,032	7,032
J 36	Southview	South	Private	0	12	0	9,899	0
J 4	Robinhood Ridge	South	City	50	41	100	10,081	10,081
	California Crossing	South	Private	0	5	0	8,466	0
K 5	Otay Lakes	Central	City	46	6	100	8,889	8,889
KK 2	Pasatiempo	Central	City	0	0	100	7,032	7,032
MM 1	Marron Valley	South	City	0	5	100	8,466	8,466
N 1-4	Teledyne Ryan	Central	Private	1	11	0	9,922	0
N 5-6	Montgomery Field	Central	City	129	10	100	10,195	10,195
N 7	Serra Mesa Library	Central	City	0	0	100	7,032	7,032
N 8	General Dynamics **	Central	City	20	6	100	8,821	8,821
NC	Li Collins	North	Private	0	0	0	7,032	0
	Kelton	South	City	0	0	100	7,032	7,032
OO	Salk Institute	North	Private	0	0	0	7,032	0
Q2	Mission Trails Regional Park School District	Central	School District	0	0	0	7,032	0
	Mission Trails Regional Park	Central	City	0	6	100	8,752	8,752
Q 3	Castlerock	North	Private	0	0	0	7,032	0
QQ	Tecolote Canyon	Central	City	0	0	100	7,032	7,032
R 1	Proctor Valley	South	City	0	3	100	7,892	7,892
U15	SANDER	Central	City	1	2	100	7,629	7,629
U 19	Cubic	Central	Private	3	6	0	8,798	0
X 5	Nobel Drive	North	City	1	6	100	8,775	8,775
X 7	Nobel Research **	North	City	0	1	100	7,319	7,319
Subtotal Level 1 (Stewardship) Monitoring and Management Cost							647,336	261,352
Data Tracking and Reporting (Bio III 1 day per week annually, City responsibility for all sites)							36,665	36,665
Changed Circumstances (refer to Table A-11 for detail, assumes City is responsible for all costs)							137,931	137,931
Contingency 16% Annually (refer to TWP 5 Section 3.1.3 for details)							43,007	43,007
TOTAL ANNUAL ONGOING COST							864,939	478,955
= Land not owned by City of San Diego			Bold	= Land not owned by City of San Diego or under the City of San Diego's land use authority				

Table A-8 Summary of Total Cost for VPHCP Preserve Monitoring and Management by Complex for the 36-Year Life of the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total Cost for VPMMP Implementation (36 Years)	City Cost for Required VPMMP Implementation (36 Years)
B 11	Mesa Norte	North	Private	16	24	0	358,006	0
B 5	Tierra Alta	North	Private	0	0	0	280,129	0
B 6	Lopez Ridge (CDFG)	North	State	1	0	0	253,988	0
B 7-8	Crescent Heights	North	City	1	0	100	253,988	253,988
	Lopez Ridge (City)	North	City	10	2	100	275,446	275,446
C 10-16	Winterwood	North	School District	27	2	0	617,625	0
C 17-18	Fieldstone	North	Private	8	0	0	0	0
C 27	Mira Mesa Market Center	North	Private	1	1	0	0	0
D 5-8	Parkdale Carroll Canyon	North	City	0	0	100	253,169	253,169
	Carroll Canyon	North	City	76	5	100	313,773	313,773
F 16-17	Menlo KM Parcel	Central	Private	0	1	0	0	0
H 1-10, 13-15, 18-23, 24-26	Del Mar Mesa (State/Federal)	North	State/Federal	154	10	0	2,097,984	0
	Del Mar Mesa (Private)	North	Private	2	1	0	315,863	0
	Del Mar Mesa (City/County)	North	City and County	64	8	84	1,097,039	925,941
	Rhodes	North	Private	12	4	0	467,805	0
H 17	Shaw Lorenz	North	Private	0	1	0	292,084	0
H 33	East Ocean Air Drive	North	Private	2	0	0	0	0
H 38	Carmel Mountain	North	City	0	2	100	304,040	304,040
H 39	Greystone Torrey Highlands	North	City	6	0	100	254,806	254,806
I 1	Arjons	North	Private	25	1	0	0	0
I 12	Pueblo Lands	North	City	0	2	100	273,809	273,809
I 6 B	Ford Leasing (Bob Baker)	North	Private	1	3	0	0	0
I 6 C	Facilities Development (Eastgate Miramar Associates)	North	Private	11	6	0	0	0
J 11 E	Slump Block Pools	South	Private	0	0	0	0	0
J 11 W	J 11 West	South	Private	0	1	0	0	0
J 12	J 12	South	Private	0	0	0	0	0
J 13 E	South Otay J 13 East	South	Private	0	0	0	0	0
J 13 N	South Otay 1 acre (private)	South	Private	0	0	0	0	0
	South Otay 1 acre (City)	South	City	3	0	100	0	0
J 13 S	South Otay J 13 South	South	Private	6	0	0	0	0
	Bachman	South	Private	0	0	0	0	0
J 14	Anderprises (Caltrans)	South	State	2	7	0	389,769	0
	Anderprises (City)	South	City	0	0	100	253,169	253,169
	Cal Terraces (South)	South	City	63	36	100	367,828	367,828
	Handler	South	Private	0	0	0	280,129	0
	Bachman	South	Private	0	0	0	253,169	0
J 15	Arnie's Point	South	Federal	62	57	0	1,078,081	0
J 16-18	Goat Mesa (Federal)	South	Federal	0	0	0	0	0
	Goat Mesa (Private)	South	Private	0	0	0	0	0
	Goat Mesa (City)	South	City	4	0	100	271,606	271,606
	Wruck Canyon	South	City	0	0	100	257,803	257,803

Table A-8 Summary of Total Cost for VPHCP Preserve Monitoring and Management by Complex for the 36-Year Life of the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total Cost for VPMMP Implementation (36 Years)	City Cost for Required VPMMP Implementation (36 Years)
J 2	Cal Terraces (North), Otay Mesa Road Parcels	South	City	219	216	100	421,921	421,921
	Clayton Parcel	South	City	1	0	100	253,988	253,988
	St. Jerome's	South	Private	0	0	0	0	0
J 20-21	La Media ITS	South	Private	0	6	0	0	0
J 21	La Media Swale South	South	Private	0	0	0	0	0
J 27	Empire Center	South	Private	9	0	0	0	0
J 28 E	La Media Swale North	South	Private	0	0	0	0	0
J 29	<i>Lonestar W (Caltrans)</i>	<i>South</i>	<i>State</i>	<i>9</i>	<i>1</i>	<i>0</i>	<i>403,235</i>	<i>0</i>
J 30	<i>Lonestar E (Caltrans)</i>	<i>South</i>	<i>State</i>	<i>0</i>	<i>70</i>	<i>0</i>	<i>428,117</i>	<i>0</i>
	Lonestar E (Private)	South	Private	33	0	0	661,468	0
J 31	<i>Dennerly West</i>	<i>South</i>	<i>State</i>	<i>0</i>	<i>38</i>	<i>0</i>	<i>384,989</i>	<i>0</i>
	Hidden Trails **	South	City	0	1	100	269,755	269,755
J 32	<i>West Otay A</i>	<i>South</i>	<i>State</i>	<i>15</i>	<i>9</i>	<i>0</i>	<i>553,346</i>	<i>0</i>
	West Otay B	South	City	0	0	100	280,129	280,129
	West Otay C	South	City	1	0	100	253,988	253,988
J 33	<i>Sweetwater High School</i>	<i>South</i>	<i>School District</i>	<i>7</i>	<i>8</i>	<i>0</i>	<i>441,748</i>	<i>0</i>
J 34	Bachman	South	Private	0	0	0	0	0
	Candlelight	South	Private	0	1	0	290,615	0
J 35	Brown Field	South	City	0	0	100	280,129	280,129
J 36	Southview	South	Private	0	12	0	0	0
J 4	Robinhood Ridge	South	City	50	41	100	362,917	362,917
	California Crossing	South	Private	0	5	0	0	0
K 5	Otay Lakes	Central	City	46	6	100	320,000	320,000
KK 2	Pasatiempo	Central	City	0	0	100	0	0
MM 1	Marron Valley	South	City	0	5	100	311,923	311,923
N 1-4	Teledyne Ryan	Central	Private	1	11	0	0	0
N 5-6	Montgomery Field	Central	City	129	10	100	367,010	367,010
N 7	Serra Mesa Library	Central	City	0	0	100	253,169	253,169
N 8	General Dynamics **	Central	City	20	6	100	317,545	317,545
NC	Li Collins	North	Private	0	0	0	0	0
	Kelton	South	City	0	0	100	0	0
OO	Salk Institute	North	Private	0	0	0	280,129	0
Q2	<i>Mission Trails Regional Park School District</i>	<i>Central</i>	<i>School District</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
	Mission Trails Regional Park	Central	City	0	6	100	350,391	350,391
Q 3	Castlerock	North	Private	0	0	0	280,129	0
QQ	Tecolote Canyon	Central	City	0	0	100	0	0
R 1	Proctor Valley	South	City	0	3	100	284,129	284,129
U15	SANDER	Central	City	1	2	100	274,628	274,628
U 19	Cubic	Central	Private	3	6	0	0	0
X 5	Nobel Drive	North	City	1	6	100	315,908	315,908

Table A-8 Summary of Total Cost for VPHCP Preserve Monitoring and Management by Complex for the 36-Year Life of the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total Cost for VPMMP Implementation (36 Years)	City Cost for Required VPMMP Implementation (36 Years)
X 7	Nobel Research **	North	City	0	1	100	263,489	263,489
Subtotal VPMMP Monitoring and Management Cost							19,765,905	9,186,398
Data Tracking and Reporting (Bio III 1 day per week annually, City responsibility for all sites)							1,319,932	1,319,932
Changed Circumstances (refer to Table A-11 for detail, assumes City is responsible for all costs)							4,965,518	4,965,518
Contingency 16% Annually (refer to TWP 5 Section 3.1.3 for details)							1,548,246	1,548,246
Total One-Time Fence/Sign Installation Cost (only certain complexes, as detailed in Table A-12)							790,878	287,134
One-Time Vernal Pool HGM Baseline Survey (see Table A-4 for detail)							141,004	73,287
TOTAL COST FOR VPMMP IMPLEMENTATION							28,531,484	17,380,515
= Land not owned by City of San Diego.				Bold	= Land not owned by City of San Diego or under the City of San Diego's land use authority			

Table A-9: Focal Vernal Pool Weed Control Cost Estimate Detail

Weed Control Task	Description of Activity	Cost/Acre	Cost/Pool
Level 2 Focal Vernal Pool Weed Control			
Dethatching 2	One-time visit (4 person crew) in pools with focal species and 20-foot buffer	\$3,000	\$277
Weed Control Level 2	Two visits (4 person crew) per spring and 20-foot foot buffer	\$2,500	\$231
TOTAL		\$5,500	\$508
Level 3 Focal Vernal PooWeed Control			
Dethatching 3	One-time visit (4 person crew) in pools with focal species and 35-foot buffer	\$3,000	\$558
Weed Control Level 3	Four visits (4 person crew) per spring and 35-foot buffer	\$4,000	\$744
TOTAL		\$7,000	\$1,302

Level 2 Watershed Area

Avg pool size (acres)	0.018
Avg pool size (sq ft)	784.08
Avg pool radius	15.80
Radius + 20-ft buffer	35.80
Area of watershed (sq ft)	4024.83
Area of watershed (acres)	0.092
Watershed/pool ratio	5.13

Level 3 Watershed Area

Avg pool size (acres)	0.018
Avg pool size (sq ft)	784.08
Avg pool radius	15.80
Radius + 35-ft buffer	50.80
Area of watershed (sq ft)	8103.89
Area of watershed (acres)	0.186
Watershed/pool ratio	10.34

Note: Costs include labor and other direct costs such as field vehicle rental, fuel, herbicide, and equipment

Table A-10: City and Consultant Staff 2012 Rates

City Staff	Fully Loaded Rate	Rate with Travel
Senior Planner/Natural Resource Manager	\$89.37	\$92.18
Biologist I	\$62.05	\$64.86
Biologist III	\$88.14	\$90.95
Pesticide Applicator (PA)	\$57.57	\$60.38
Pesticide Applicator (PA) plus Herbicide	\$63.82	\$66.63
Grounds Maintenance Manager (GMM)	\$71.95	\$74.76
Ranger	\$58.85	\$61.66
Senior Ranger	\$71.71	\$74.52

Consultant Staff	Fully Loaded Rate	Rate with Travel
Senior Restoration Ecologist/Biologist	\$158.85	\$171.35
Biologist I	\$86.07	\$98.57
Maintenance/Restoration Crew	\$47.50	\$60.00
Maintenance/Restoration Crew plus Herbicide	\$53.75	\$66.25

Notes:

Fringe and overhead are included in the fully loaded rates

Rates with travel include \$2.81 per hour for City staff (City fleet car) and \$12.50 per hour for Consultant staff (rental vehicle plus fuel)

Herbicide Cost Assumptions:

Herbicide \$ per acre = 50

Hours for 1 acre herbicide spraying = 8

Herbicide \$/hr = 6.25

Table A-11: Cost Estimate for Changed Circumstances

Task	Assumptions	Staff	Title	Loaded Rate	Avg. Hours	Unit	Timing	Cost per Unit	Avg. Pools/ Complexes Requiring Enhanced Management	Total Cost
Enhanced Fairy Shrimp Management										
Shrimp Cyst Collection	Performed by permitted biologist	Consultant	Bio I	\$99	0.5	Pool	Annual	\$49	32	\$1,587
Shrimp Cyst Bulking	Performed by permitted biologist	Consultant	Bio I	\$99	120	Complex	Annual	\$11,828	4	\$48,496
Shrimp Cyst Dispersal	Performed by permitted biologist	Consultant	Bio I	\$99	0.25	Pool	Annual	\$25	32	\$793
* Assumes 5% of focal species pools/complexes within the VPHCP Preserve will require enhanced fairy shrimp management annually									Avg. Annual Total	\$50,877
									Total for 36 Years	\$1,831,569
Post-Fire Management										
Perform Post-Fire Management	Assume 2 average size complex (50 vernal pools each) burns once every 10 years. Burned complexes will require certain Level 3 management activities (general maintenance, weed control, and seeding) to recover. Level 3 qualitative and quantitative (focal plants and shrimp pools) monitoring would also be necessary. Following the 5-year period, the site would be elevated to Level 1 status.	Consultant	Varied (see Table A-3 for specific Level 3 staff)	Varied (see Table A-3 for rates for Level 3 staff)	Varied (see Table A-3 for Level 3 hours for various tasks)	All pools and overall complex for limited Level 3 management and monitoring	Two complexes once per 10 years	Level 3 costs for specified management and monitoring activities	Total of 6 complexes (50 pools each) burn during life of the HCP Permit (36 years)	
									Total for 36 Years	\$3,133,950
									Avg. Annual Total	\$87,054

Table A-12: Fence and Sign Installation Cost Assumptions

Complex ID	Name	Geographic Area	Fenced (Y/N)	20' Buffer Perimeter Around Complex (LF)
B 11	Mesa Norte	North	Y	
B 5	Tierra Alta	North	N	186
B 6	Lopez Ridge (CDFG)	North	Y	
B 7-8	Crescent Heights	North	Y	
	Lopez Ridge (City)	North	Y	
C 10-16	Winterwood	North	Y	
C 17-18	Fieldstone	North	Y	
C 27	Mira Mesa Market Center	North	Y	
D 5-8	Parkdale Carroll Canyon	North	Y	
	Carroll Canyon	North	Y	
F 16-17	Menlo KM Parcel	Central	Y	
H 1-10, 13-15, 18-23, 24-26	Del Mar Mesa (State/Federal)	North	Y	
	Del Mar Mesa (Private)	North	N	1,336
	Del Mar Mesa (City/County)	North	N	3,049
	Rhodes	North	Y	
H 17	Shaw Lorenz	North	Y	
H 33	East Ocean Air Drive	North	N	457
H 38	Carmel Mountain	North	Y	
H 39	Greystone Torrey Highlands	North	Y	
I 1	Arjons	North	Y	
I12	Pueblo Lands	North	N	1,185
I 6 B	Ford Leasing (Bob Baker)	North	Y	
I 6 C	Facilities Development (Eastgate Miramar Associates)	North	Y	
J 11 E	Slump Block Pools	South	N	1,180
J 11 W	J 11 West	South	N	2,113
J 12	J 12	South	N	1,416
J 13 E	South Otay J 13 East	South	N	1,648
J 13 N	South Otay 1 acre (private)	South	Y	
	South Otay 1 acre (City)	South	N	2,514
J 13 S	South Otay J 13 South	South	N	5,719
	Bachman	South	N	203
J 14	Anderprises (Caltrans)	South	N	5,361
	Anderprises (City)	South	N	226
	Cal Terraces (South)	South	Y	
	Handler	South	N	2,249
	Bachman	South	Y	
J 15	Arnie's Point	South	Y	
J 16-18	Goat Mesa (Federal)	South	N	641
	Goat Mesa (Private)	South	N	220
	Goat Mesa (City)	South	Y	
	Wruck Canyon	South	N	983
J 2	Cal Terraces (North), Otay Mesa Road Parcels	South	Y	
	Clayton Parcel	South	N	5,278
	St. Jerome's	South	N	1,366
J 20-21	La Media ITS	South	N	6,354
J 21	La Media Swale South	South	N	1,630
J 27	Empire Center	South	N	812
J 28 E	La Media Swale North	South	N	1,356
J 29	Lonestar W (Caltrans)	South	Y	
J 30	Lonestar E (Caltrans)	South	Y	
	Lonestar E (Private)	South	Y	
J 31	Dennery West	South	Y	
	Hidden Trails	South	Y	
J 32	West Otay A	South	N	3,182
	West Otay B	South	N	1,146
	West Otay C	South	N	965
J 33	Sweetwater High School	South	Y	
J 34	Bachman	South	N	2,102
	Candlelight	South	N	4,392
J 35	Brown Field	South	Y	
J 36	Southview	South	N	2,836
J 4	Robinhood Ridge	South	Y	
	California Crossing	South	N	1,323
K 5	Otay Lakes	Central	Y	
KK 2	Pasatiempo	Central	N	1,383
MM 1	Marron Valley	South	Y	
N 1-4	Teledyne Ryan	Central	Y	
N 5-6	Montgomery Field	Central	Y	
N 7	Serra Mesa Library	Central	Y	
N 8	General Dynamics	Central	Y	
NC	Li Collins	North	Y	
	Kelton	South	Y	
OO	Salk Institute	North	Y	
Q2	Mission Trails Regional Park School District	Central	N	300
	Mission Trails Regional Park	Central	Y	
Q 3	Castlerock	North	Y	
QQ	Tecolote Canyon	Central	N	1,738
R 1	Proctor Valley	South	Y	
U15	SANDER	Central	N	5,893
U 19	Cubic	Central	N	3,793
X 5	Nobel Drive	North	Y	
X 7	Nobel Research	North	Y	

Type	Cost per Linear Foot (LF)
Peeler Log	\$7.61
3-strand Wire	\$5.50
Average Cost	\$6.56
Installed LF/hr	20
Labor/hr per LF	\$3.74
Loaded Rate (LF)	\$10.29

Note: Costs include fence and sign materials plus installation by a GMM

FINAL DRAFT

**TECHNICAL WHITE PAPER 5:
COST EVALUATION FOR THE CITY OF SAN DIEGO
VERNAL POOL HABITAT CONSERVATION PLAN
MONITORING AND MANAGEMENT PROGRAM**

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Please note that the Technical White Papers are the products of professional consultants hired by SANDAG Service Bureau, and that the City of San Diego and/or Wildlife Agencies may not concur with the recommendations contained in these reports.

August 2012

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
CHAPTER 1 – INTRODUCTION	1
1.1 Project Background.....	1
1.2 Overview of VPMMP	3
1.3 Overview of the VPMMP Cost Evaluation	3
CHAPTER 2 – COST ASSUMPTIONS AND METHODOLOGY.....	5
2.1 Cost by Management Level	5
2.2 Other One-Time and Potential As-Needed Costs	6
CHAPTER 3 – COST ESTIMATE FOR VPMMP IMPLEMENTATION	9
3.1 Project Costs	9
3.1.1 Overview	9
3.1.2 Summary of Project Costs.....	11
3.1.3 Annual Contingency Fund	13
3.1.4 Changed Circumstances	14
3.2 Costs for ALternative 1 - Baseline.....	16
3.3 Additional Costs For Alternative 2 – Expanded Conservation.....	17
CHAPTER 4 – REFERENCES	19
ATTACHMENT A. Cost Evaluation	

LIST OF TABLES

<u>Table</u>	<u>Page</u>
3-1 Project One-Time Costs for VPMMP-Required Monitoring and Management Level for Level 2 and 3 Complexes, Baseline HGM Surveys and Fence/Sign Installation.....	12
3-2 Project Annual Ongoing VPMMP Level 1 Monitoring and Management Costs	12
3-3 Project VPMMP Implementation Costs for Life of the Project (36 Years).....	13
3-4 Cost Assumptions for Changed Circumstances.....	14
3-5 Alternative 1 One-Time Costs for VPMMP-Required Monitoring and Management Level for Level 2 and 3 Complexes, Baseline HGM Surveys and Fence/Sign Installation.....	16
3-6 Alternative 1 Annual Ongoing VPMMP Level 1 Monitoring and Management Costs.....	17
3-7 Alternative 1 VPMMP Implementation Costs for Life of the Project (36 Years)	17
3-8 Additional Annual Costs Associated with VPMMP Implementation for Alternative 2.....	18

CHAPTER 1

INTRODUCTION

1.1 PROJECT BACKGROUND

The San Diego Association of Governments Service Bureau (SANDAG Service Bureau) will prepare a Vernal Pool Habitat Conservation Plan (VPHCP) for the City of San Diego (City) largely based on information contained in a series of Technical White Papers (TWPs). The Planning Area for the VPHCP is the geographical extent of land that will be included in the VPHCP and for which the protections provided under the VPHCP are afforded to the seven focal species. For the City's VPHCP, these lands include the entire jurisdictional boundaries of the City and three areas owned by the City's Public Utilities Department in the unincorporated portion of San Diego County. The Planning Area's extent is, by design, the area covered by the City's Multiple Species Conservation Program (MSCP); the VPHCP is a separate but compatible conservation plan for vernal pools and seven endangered focal species not covered under the City's MSCP.

Many lands included in the Planning Area are not under the local land use jurisdiction of the City. These lands could include special districts such as school districts, military lands, other federal properties, and state lands. The regulatory requirements of the VPHCP are not applicable to lands not under the land use jurisdiction of the City. If land ownership is transferred and subsequently comes under the City's jurisdiction, or if the owner voluntarily requests inclusion, the VPHCP regulatory requirements will be applied after undergoing the appropriate amendment process, as outlined in the VPHCP.

The TWPs and VPHCP focus on seven target vernal pool species consisting of five plants and two crustaceans:

- Otay Mesa mint (*Pogogyne nudiuscula*)
- San Diego Mesa mint (*Pogogyne abramsii*)
- Spreading navarretia (*Navarretia fossalis*)
- San Diego button-celery (*Eryngium aristulatum* var. *parishii*)
- California Orcutt grass (*Orcuttia californica*)
- Riverside fairy shrimp (*Streptocephalus wootoni*)
- San Diego fairy shrimp (*Branchinecta sandiegonensis*)

The TWP topics are as follows:

- TWP 1: Focal Species Status Update in the City of San Diego
- TWP 2: Assessment of Focal Species Conservation
- TWP 3: Development of Adaptive Management Strategy, and TWP 4: Development of Monitoring Strategy (a combined document) (referred to as TWP 3 & 4)
- TWP 5: Cost Evaluation for Implementation of Management and Monitoring
- TWP 6: Recommendations for Conditions of Coverage
- TWP 7: Conservation Analysis
- TWP 8: Preserve Management Funding Mechanisms

This is TWP 5. It provides a cost evaluation for implementing a monitoring and management program for the City's proposed VPHCP Preserve (Preserve) over the 36-year life of the project. Monitoring and management costs are estimated based on the activities included in the vernal pool monitoring and management program (VPMMP), developed in the combined document TWP 3 & 4 (AECOM 2012a). The VPMMP provides management and monitoring strategies, directives, and recommendations for lands containing vernal pools in the VPHCP Preserve to preserve and/or restore their biological components, particularly the seven focal threatened and endangered species. Currently, the City is responsible for implementing the VPMMP on lands subject to City jurisdiction under City ownership. It is possible that in the future the City may acquire additional privately owned lands in the Preserve within their jurisdiction.

The proposed VPHCP Preserve (the Project) would conserve lands that include 2,861 vernal pools within a total of 58 vernal pool complexes.¹ There are two alternative Preserve boundaries. Alternative 1 (Baseline) conserves 660 fewer vernal pools than the Project, including 2,201 vernal pools within a total of 43 complexes in the Preserve. Alternative 2 (Expanded Conservation) conserves 37 more pools than the Project, generally located on Del Mar mesa and Otay Mesa, and includes 2,898 vernal pools within the same 58 complexes as the Project. TWP 2 (AECOM 2012b) provides more detail on the Project and two alternatives. It is anticipated that Alternative 1 (Baseline) will not be implemented because it does not provide adequate coverage for the seven vernal pool focal species (as detailed in TWP 6 [AECOM 2012c]); therefore, TWP 5 includes a cost evaluation for the Project and Alternative 2 (Expanded Conservation) only.

¹ Vernal pool complexes may include two to several hundred individual vernal pools (Keeler-Wolf et al. 1998). Typically, the pools in a complex are connected through the landscape, including the supporting watershed and upland habitats. These vernal pool complexes were given identification numbers by Bauder (1986). The numbers were updated by the City of San Diego's Vernal Pool Inventory (2004) and again updated by SANDAG Service Bureau (2011).

1.2 OVERVIEW OF VPMMP

The VPMMP developed in TWP 3 & 4 uses a three-tiered approach to adaptive monitoring and management that is applied to individual vernal pool complexes. Adaptive management is an iterative process of learning about a resource through monitoring, and then making decisions to optimize management of that resource to achieve specific objectives.

The goals of the monitoring and management levels are as follows:

- Level 1 – Stewardship: *maintain* existing habitat conditions and existing focal species population status.
- Level 2 – Enhancement: *stabilize* focal species population status by enhancing habitat conditions to a level that can support existing populations.
- Level 3 – Restoration: *remediate* declining focal species population status by restoring habitat conditions to a level that can support baseline (defined by the City's 2004 Vernal Pool Inventory) focal species populations.

Each of the three levels of monitoring and management is linked to the VPMMP objectives (as defined in TWP 3 & 4) for existing habitat conditions and focal species population status within a complex.

Each complex is evaluated to identify adaptive monitoring and management actions based on triggers directly tied to the VPMMP objectives. The VPMMP describes the necessary monitoring methods used for each level of monitoring and the triggers for management actions based on the data collected during monitoring. The necessary management actions to be taken based on the triggers for each level of maintenance are also identified. Necessary actions are those required to conserve and protect populations of each of the seven focal species under the VPHCP. Each vernal pool complex is assigned a level based on necessary management actions.

1.3 OVERVIEW OF THE VPMMP COST EVALUATION

The VPMMP for the VPHCP Preserve identifies three levels of monitoring and management, with the level of effort (and therefore cost) required to conserve and protect populations of the seven focal species under the VPHCP increasing from Level 1 (Stewardship) to Level 3 (Restoration). For each VPMMP level, TWP 5 estimates a general annual cost for the necessary monitoring and management actions (Chapter 2). Those general costs for each level are then

used to determine various categories of VPMMP implementation costs under the Project (Chapter 3), including required and recommended activities for each complex. Other costs for VPMMP implementation (such as initial baseline hydrological surveys, data tracking/reporting, and costs for changed circumstances) and an annual contingency are also estimated.

The various VPMMP implementation costs for the Project are then compared to the costs for Alternative 2 (Chapter 3). Other potential “as-needed” costs associated with implementation of certain activities identified in the VPMMP, which may not be necessary for all complexes, are also provided in Chapter 3 for consideration by the City.

Attachment A includes the following tables for the cost evaluation:

- Table A-1: Level 1 Monitoring and Management Costs
- Table A-2: Level 2 Monitoring and Management Costs
- Table A-3: Level 3 Monitoring and Management Costs
- Table A-4: Other One-Time (Mandatory) and Potential As-Needed (Optional) Costs for VPHCP Preserve Monitoring and Management
- Table A-5: City of San Diego VPHCP Preserve Monitoring and Management Comprehensive Cost Estimate by Complex for the Project
- Table A-6: Summary of One-Time Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)
- Table A-7: Summary of Annual Ongoing Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)
- Table A-7: Summary of Total Costs for VPHCP Preserve Monitoring and Management by Complex for the 36-Year Life of the Project (2012 Dollars)
- Table A-9: Weed Control Cost Estimate Detail
- Table A-10: City and Consultant Staff 2012 Rates
- Table A-11: Cost Estimate for Changed Circumstances
- Table A-12: Fence and Sign Installation Cost Assumptions
- Table A-13: City of San Diego VPHCP Preserve Monitoring and Management Comprehensive Cost Estimate by Complex for Alternative 1 (Baseline)

The costs generated in TWP 5 are directly linked to the monitoring and management activities detailed in TWPs 3&4, as well as the complex-specific management plans being developed by the City. If any changes are made to the monitoring and/or management methods outlined in TWPs 3&4 or the complex-specific management plans, then the costs in TWP 5 may no longer be accurate.

CHAPTER 2

COST ASSUMPTIONS AND METHODOLOGY

2.1 COST BY MANAGEMENT LEVEL

Attachment A provides a cost estimate for the necessary activities associated with each monitoring and management level, as defined in the VPMMP (Attachment A-1 for Level 1, Attachment A-2 for Level 2, Attachment A-3 for Level 3). Detailed assumptions for each activity associated with a level are provided in the Attachment A tables. Overall assumptions for developing costs for each level are provided below:

- Estimated costs are in 2012 dollars. Escalation is not factored into the cost estimate.
- Cost estimates are generalized based on AECOM's previous experience and agency input (City, SANDAG Service Bureau, the U.S. Fish and Wildlife Service [USFWS], and the California Department of Fish and Game [CDFG]) on overseeing and implementing monitoring and management of vernal pools in the San Diego region.
- Adequate access protection (e.g., fencing, signage) is in place or will be installed at each complex in the Preserve prior to implementation of other management activities. One-time costs for fence and sign installation (where needed, based on City input), as well as repair and replacement costs (assumed under each management level), are included in Attachment A. Site patrol/enforcement is assumed under Level 1 as part of annual ongoing Stewardship costs.
- Management and monitoring activities will be performed by either City staff or Consultants depending on the level and type of activity. In general, Level 1 activities will be performed by City staff. Note that Level 1 management activities (trash removal, access control maintenance, edge effect repair) are also performed under Levels 2 and 3 by City staff. It is assumed that Level 2 monitoring activities will be performed by City staff, while Level 2 management will be performed by Consultant staff. It is assumed that Level 3 monitoring and maintenance activities will be performed by Consultant staff.
- City and Consultant biologists performing monitoring and management activities will have the appropriate permits to work with the focal species and have a minimum of 3 years of local field experience with vernal pool vegetation, fauna, hydrology, and soils.
- Weed control costs for focal species vernal pools were extrapolated based on the average size of vernal pools with focal species within the Preserve (0.018 acre). The area of weed

control per pool was derived using a basin-to-watershed ratio of approximately 1:5 for Level 2 Weed Control (20-foot buffer treated around each pool) and approximately 1:10 for Level 3 Weed Control (35-foot buffer treated around each pool). Weed control costs for focal species vernal pool include labor plus other direct costs such as field vehicle rental, fuel, herbicide, and equipment. A separate line item is included in each management level for general weed control of the upland watershed and non-focal-species vernal pools. Table A-6 in Attachment A provides more detail on weed control cost estimates.

- For cost estimating purposes, Consultant rates are based on typical contracted audited rates for SANDAG Service Bureau Consultant staff. City staff costs are based on 2012 rates provided by the City. Other direct costs (fringe, overhead) and travel (vehicle use and fuel) are assumed in the fully loaded staff rates. Details on City and Consultant rates are provided in Table A-7 in Attachment A.

2.2 OTHER ONE-TIME AND POTENTIAL AS-NEEDED COSTS

Table A-4 of Attachment A includes other on-time costs that are mandatory for VPMMP implementation, as well as potential as-needed costs that are optional.

One-time mandatory costs involve a baseline hydrological survey to measure maximum basin depth and watershed connectivity (based on assessment methods identified under the Hydrogeomorphic [HGM] Approach [Bauder et al. 2009]) for every vernal pool within the VPHCP Preserve (regardless of management and monitoring level), including lands under City control and lands under other ownership. The baseline hydrological data will be used during VPMMP Level 2 and 3 monitoring to evaluate changes in vernal pool water storage and hydrological connectivity. All complexes need baseline hydrological data collected, in the event that a Level 1 complex declines to Level 2 or 3, at which point comparisons to baseline hydrological data would be required. The cost for this one-time survey is detailed in Table A-4 (broken down between City-controlled and other lands), and is incorporated into the cost of VPMMP implementation (Tables A-5 through A-7). It is assumed that this baseline hydrological survey will be performed during the first 5 years of VPMMP implementation. It is assumed that baseline hydrological data collection for Level 2 and 3 complexes is required to be funded under the VPHCP. It is recommended that baseline hydrological data collection for Level 1 complexes be funded via an outside funding source (e.g., a grant).

Optional costs for Levels 1, 2, and 3, such as site-specific restoration plans and topographic restoration, are not included as part of the total implementation cost for the VPMMP levels

because not all complexes, if any, will require the as-needed activities. These costs are provided in Table A-4 for reference if and when VPMMP monitoring indicates the need for these activities (as determined by the City). If a complex changes management level, the City can choose to add these activities, as needed. It is assumed that funding for as-needed activities would come from the annual contingency fund, at the discretion of the City (see Section 3.1.3).

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CHAPTER 3

COST ESTIMATE FOR VPMMP IMPLEMENTATION

3.1 PROJECT COSTS

3.1.1 Overview

The estimated cost for the different monitoring and management levels was used to determine a total cost of implementation of the VPMMP at each complex in the Preserve over the life of the Project (36 years). Costs differ at each complex based on the number of vernal pools with focal species, level of effort associated with assigned monitoring and management level (Levels 1, 2, and 3), and type of staff performing the monitoring and management (City or Consultant). Table A-5 of Attachment A provides various types (based on land ownership) and phases (one-time versus ongoing) of VPMMP implementation costs by complex, as follows:

- The total one-time cost to implement enhancement (Level 2) and restoration (Level 3 or Site-Specific Management Plan) for each complex within the VPHCP Preserve, regardless of land ownership and management responsibility. The following assumptions were made about the time-frame for one-time monitoring and maintenance costs for these specific VPMMP levels:
 - Level 3 (Restoration) maintenance and monitoring would last 5 years. Each complex at Level 3 is assumed to be stabilized following the 5-year period and will be elevated to Level 1 (Stewardship) status.
 - Level 2 (Enhancement) maintenance and monitoring would last 3 years. Each complex at Level 2 is assumed to be stabilized following 3 years, and will then be elevated to Level 1 (Stewardship) status.
- The City's one-time cost to implement enhancement (Level 2) and restoration (Level 3 or Site-Specific Management Plan) for each complex within the VPHCP Preserve.
- The total annual ongoing cost for Level 1 (Stewardship) monitoring and management at each complex within the Preserve, regardless of land ownership and management responsibility.
- The total annual ongoing cost for Level 1 (Stewardship) monitoring and management at each complex (or portion of a complex) on City-controlled land within the Preserve.

-
- The total cost for the VPMMP recommended (based on input from the City and resource agencies) monitoring and management level for each complex within the Preserve (ranges from Level 1 to Level 3, or may include Site-Specific Actions), regardless of land ownership and management responsibility. The recommended level is not required to be implemented under the VPHCP, but is provided for consideration should additional funding become available in the future. Not all complexes have a recommended monitoring and management level.
 - The City's potential cost for the VPMMP recommended monitoring and management level at each complex (or portion of a complex) on City-controlled land within the Preserve, should additional funding become available.
 - The total cost for VPMMP implementation over the 36-year life of the Project (in 2012 dollars, not adjusted for inflation), regardless of land ownership and management responsibility, including the one-time required costs, annual ongoing costs, reporting, changed circumstances, and contingency.
 - The City's total cost for VPMMP implementation for complexes on City-controlled land within the Preserve over the 36-year life of the Project, including the one-time required costs, annual ongoing costs, reporting, changed circumstances, and contingency.

Note that certain complexes do not have a required monitoring and management level in the VPMMP (noted as "None" in Table A-5). Some complexes do not have focal species and do not warrant monitoring and management, as agreed upon by the City, SANDAG Service Bureau, USFWS, and CDFG. Some complexes are privately held and may seek development entitlement in the future. During the development entitlement process, the City will ensure that the property owner implements the Recommended Management activities as appropriate for the level of mitigation outlined in the VPMMP. Other complexes that are not under City control have been developed pursuant to prior approval by the City of San Diego. No management was required at that time, nor is any management being required as part of the VPHCP. As funding becomes available, the City may work with the owner to implement the Additional Recommended Management activities.

Certain complexes may also have Site-Specific Management Plans (SSMP), instead of a required monitoring and management level. SSMPs are existing or future resource agency-approved plans that guide monitoring and management activities for the complex. For cost estimating purposes, it is assumed that costs for implementation of an SSMP are comparable to a Level 3 monitoring and management level. In some cases, privately owned complexes with an SSMP have a recommended monitoring and management level in the event that the City gains control of the

land. For resource agency-approved mitigation projects, it is assumed that, after 5 years of Level 3 maintenance and monitoring, the site will be elevated to Level 1, and maintained at that level in perpetuity.

In addition to management and monitoring activities, it is assumed that City staff time will be required for data tracking, analysis, and reporting. City staff will also need to coordinate with private landowners and managers regarding VPMMP required activities, including obtaining required data and reporting information for focal species vernal pools on private land. The cost estimate assumes an average time commitment of one day a week for a City biologist (Biologist III) for this effort, which is included as an individual line item in Table A-5.

The cost calculation methodology allows the City the flexibility to adjust complex-specific costs as adaptive management and monitoring decisions are made in the future. If, through management and monitoring (as detailed in the VPMMP in TWP 3 & 4), it is determined that the management level for a complex must be elevated or lowered, the City can adjust the cost estimate for that particular complex using the management and monitoring level-specific costs in Tables A-1 through A-3. Costs can be tailored to reflect specific management and monitoring needs identified for a complex.

3.1.2 Summary of Project Costs

The tables below summarize the one-time and annual ongoing Project costs, as well as the total costs for the 36-year life of the Project. Table 3-1 summarizes the one-time costs for implementation of the VPMMP-required monitoring and management level by geographic area (3-year initial period for Level 2 complexes and 5-year period for Level 3 or SSMP complexes), as well as the one-time costs for HGM baseline hydrological surveys (all complexes) and fence and sign installation (at certain complexes, as detailed in Table A-12). Table 3-1 does not include complexes at Level 1, because those costs are assumed in the annual ongoing cost in Table 3-2.

Table 3-2 summarizes the annual ongoing costs for every complex at Level 1 by geographic area. After the initial 3-year period for Level 2 complexes and 5-year period for Level 3 or SSMP complexes, all complexes are assumed to be maintained at Level 1, as shown in Table 3-2.

Table 3-3 includes the total cost for VPMMP implementation over the 36-year life of the Project. The total cost for VPMMP implementation was generated based on the total of the one-time costs for the VPMMP-required monitoring and management level (Level 2, Level 3, or SSMP complexes) plus annual ongoing Level 1 costs for all complexes.

Cost assumptions for contingency and changed circumstances are summarized in Tables 3-2 and 3-3, and discussed in more detail in Sections 3.1.3 and 3.1.4, respectively.

Table 3-1
Project One-Time Costs for VPMMP-Required Monitoring
and Management Level for Level 2 and 3 Complexes,¹
Baseline HGM Surveys and Fence/Sign Installation

Cost Category	Total Costs (\$)	City Cost (\$)
Subtotal for Vernal Pool Complex Monitoring and Management by Geographic Area	6,120,077	1,071,633
North	3,578,914	745,570
Central	78,818	78,818
South	2,462,345	247,245
Baseline HGM Hydrological Surveys	141,004	73,238
Fence/Sign Installation	787,790	245,848
TOTAL ONE-TIME PROJECT COST	7,048,872	1,390,718

Note: Costs have been rounded to the nearest dollar and are detailed in Attachment A.

¹ One-time costs are for an initial 3-year period of monitoring and management for Level 2 complexes and a 5-year period for Level 3 complexes. This does not include Level 1 complexes (included in Table 3-2).

Table 3-2
Project Annual Ongoing VPMMP Level 1 Monitoring and Management Costs¹

Cost Category	Total Costs (\$)	City Cost (\$)
Subtotal for Vernal Pool Complex Monitoring and Management by Geographic Area	795,251	321,947
North	258,453	94,546
Central	119,989	79,868
South	416,808	147,533
Reporting	36,665	36,665
Changed Circumstances	137,890	137,890
Annual Contingency	42,832	42,832
TOTAL ANNUAL ONGOING PROJECT COST	1,012,638	539,335

Note: Costs have been rounded to the nearest dollar and are detailed in Attachment A.

¹ Annual costs are ongoing once a complex is at Level 1. Level 2 complexes will be at Level 1 after 3 years, and Level 3/SSMP complexes will be at Level 1 after 5 years.

Table 3-3
Project VPMMP Implementation Costs for Life of the Project (36 Years)¹

Cost Category	Total Costs (\$)	City Cost (\$)
Subtotal for Vernal Pool Complex Monitoring and Management by Geographic Area	22,830,025	11,047,109
North	10,055,040	4,054,419
Central	2,269,586	2,269,586
South	10,505,399	4,723,103
Baseline HGM Hydrological Surveys	141,004	73,238
Fencing	787,790	245,848
Reporting	1,319,932	1,319,932
Changed Circumstances	4,964,040	4,964,040
Total Contingency	1,541,966	1,541,966
TOTAL PROJECT IMPLEMENTATION COST	31,584,758	19,192,132

Note: Costs have been rounded to the nearest dollar and are detailed in Attachment A.

¹ Includes initial one-time costs for Level 2 and 3 complexes, plus ongoing costs for complexes at Level 1.

3.1.3 Annual Contingency Fund

Annual ongoing costs assume that all complexes will be maintained at Level 1 monitoring and maintenance (after initial Level 2 and 3 complexes are elevated to Level 1 status). However, over time it is realistic to anticipate that some complexes may decline to Level 2 or Level 3. In addition, it is possible that unanticipated costs may result from unexpected activities, such as illegal grading. Therefore, it is prudent for the City to include an annual contingency amount to account for potential additional monitoring and maintenance costs associated with a decline in a complex's management level.

To determine an appropriate annual contingency, it is assumed that, on average each year during the 36-year life of the VPHCP permit, either two average-sized complexes will be at Level 2 *or* one average-sized complex will be at Level 3. To estimate the contingency amount, the average Level 2 and Level 3 costs were determined using the average number of vernal pools with focal plant species (13 pools) and shrimp species (three pools) for each complex within the Preserve. The average annual cost associated with this assumption is approximately \$42,800. This equates to approximately 13.3% of the City's annual ongoing Level 1 monitoring and management costs for the Preserve (\$321,947, refer to Table 3-2). Therefore, a 16% annual contingency is appropriate to account for additional costs associated with complexes declining from Level 1.

Site conditions and monitoring and management requirements will vary among sites and between years depending on a variety of factors, such as rainfall patterns, changes to the surrounding environment, and success of management techniques. Estimated costs are averages and may fluctuate between years of Project implementation. It is recommended that the City establish a funding mechanism that allows for rollover of unexpended Project funds (including the contingency) for use in future years.

3.1.4 Changed Circumstances

Separate from the contingency, additional costs may be associated with “changed circumstances,” that is, unforeseen circumstances that necessitate additional monitoring and management beyond what is identified in the VPMMP. Based on guidance from USFWS, two specific categories of changed circumstances are included in this cost analysis, as shown in Table 3-4. Cost assumptions are summarized, including average annual cost and total cost for the 36-year life of the Project. More detail is provided in Table A-11 of Attachment A.

Table 3-4
Cost Assumptions for Changed Circumstances

Category	Time-Frame for Implementation	Average Annual Cost	Life of VPHCP Permit (36 years)
Post-Fire Management	Once every 10 years	\$87,013*	\$3,132,471
Enhanced Fairy Shrimp Management	Annual	\$50,877	\$1,831,569
TOTAL		\$137,890	\$4,964,040

Note: Costs have been rounded to the nearest dollar and are detailed in Attachment A.

*Although post-fire management costs are assumed to be incurred once every 10 years (see Table A-11), an average annual cost is extrapolated for cost estimating purposes.

While the likelihood of occurrence and magnitude of subsequent effects of these circumstances are highly unknown, an estimated level of effort (and associated costs) is provided for consideration. Activities and assumptions associated with the changed circumstances categories are discussed below.

Post-Fire Management

For this cost analysis, it is assumed that a catastrophic fire will burn two average-size complexes (50 vernal pools) once every 10 years. Burned complexes will require limited Level 3 management and monitoring to recover (5 years). Management activities to restore burned complexes will involve general maintenance (trash removal, access control, etc.); weed control

in vernal pools and the upland watershed; and seed collection, bulking, and dispersal. Monitoring will involve quantitative observations and Level 3 quantitative monitoring for focal plant species to monitor re-seeding success for all vernal pools in a complex and focal shrimp species pools (based on pre-fire conditions). It is assumed that, following 5 years of post-fire restoration, a burned complex will be elevated to Level 1 monitoring and management.

Enhanced Fairy Shrimp Management

Fairy shrimp (San Diego or Riverside) population decline is another unforeseen circumstance that may arise due to possible hybridization with versatile fairy shrimp or other yet-to-be determined causes. It is possible that, based on direction from USFWS, the City may be required to implement an enhanced level of effort for management of San Diego and/or Riverside fairy shrimp should a population decline occur. In a good-faith effort to address potential enhanced fairy shrimp management, a cost estimate was developed based on a possible fairy shrimp cyst bulking program. A cyst bank bulking inoculation program could potentially be implemented to address fairy shrimp population issues. Fairy shrimp cyst bank bulking is experimental in design and implementation, and should only be conducted upon approval by USFWS and under the direct supervision of a qualified biologist with permits for handling endangered fairy shrimp species. The guidelines discussed below should be considered.

To implement a cyst banking/inoculation program, cyst-rich soil could be collected from pools known to be occupied by San Diego or Riverside fairy shrimp (and ideally free of versatile fairy shrimp). Soil would be taken to a lab, placed in artificial basins (plastic pools or tubes), and inundated for at least 4 weeks to hatch the fairy shrimp and other crustacean species. A reverse osmosis system would be used to remove minerals and chemicals (chlorine) from the water.

Mature fairy shrimp and other crustacean species would be identified and placed in smaller containers for egg and cyst collection. It is difficult to identify the species of adult male fairy shrimp without the use of magnification, which usually requires the shrimp to be euthanized before identification. However, females can be identified accurately without magnification. To ensure that San Diego and Riverside fairy shrimp are the only shrimp species being collected, only adult females that have bred and developed cyst sacs would be placed in the collection containers.

Fairy shrimp and other crustacean species would drop their eggs and cysts into a sterile medium in the collection containers. Once the adult crustacean species reproduce and completed their life cycle, the collection containers would be dried so that the sand rich with eggs and cysts can be collected and stored.

Soil rich with San Diego and/or Riverside fairy shrimp cysts could be used to inoculate pools and enhance or reestablish populations. Pools could also be saturated with San Diego and/or Riverside fairy shrimp cysts to possibly outcompete versatile fairy shrimp and prevent hybridization. These methods have not been tested, and would only be conducted under the direction and supervision of USFWS.

3.2 COSTS FOR ALTERNATIVE 1 - BASELINE

Because Alternative 1 (Baseline) would conserve fewer complexes and focal species pools compared to the Project (refer to TWP 2 for a detailed analysis [AECOM 2012b]), the cost of implementation of Alternative 1 (one-time and annually) is inherently less than for the Project. Tables 3-5 through 3-7 summarize the one-time, annual, and total implementation costs for Alternative 1 (similar to the tables provided for the Project in Section 3.1.2). Costs are detailed further by complex in Attachment A, Table A-13.

Table 3-5
Alternative 1 One-Time Costs for VPMMP-Required Monitoring
and Management Level for Level 2 and 3 Complexes,¹ Baseline HGM Surveys and
Fence/Sign Installation

Cost Category	Total Costs (\$)	City Cost (\$)
Subtotal for Vernal Pool Complex Monitoring and Management	5,596,503	1,071,633
Baseline HGM Hydrological Surveys	108,476	68,358
Fence/Sign Installation	441,681	170,954
TOTAL ONE-TIME COST FOR ALTERNATIVE 1	6,146,661	1,310,946

Note: Costs have been rounded to the nearest dollar and are detailed in Attachment A.

¹ One-time costs are for an initial 3-year period of monitoring and management for Level 2 complexes and a 5-year period for Level 3 complexes. This does not include Level 1 complexes (included in Table 3-6).

Table 3-6
Alternative 1 Annual Ongoing VPMMP Level 1 Monitoring and Management Costs¹

Cost Category	Total Costs (\$)	City Cost (\$)
Subtotal for Vernal Pool Complex Monitoring and Management	580,835	294,950
Reporting	36,665	36,665
Changed Circumstances	124,716	124,716
Annual Contingency	39,228	39,228
TOTAL ANNUAL ONGOING COST FOR ALTERNATIVE 1	781,444	495,559

Note: Costs have been rounded to the nearest dollar and are detailed in Attachment A.

¹ Annual costs are ongoing once a complex is at Level 1. Level 2 complexes will be at Level 1 after 3 years, and Level 3/SSMP complexes will be at Level 1 after 5 years.

Table 3-7
Alternative 1 VPMMP Implementation Costs for Life of the Project (36 Years)¹

Cost Category	Total Costs (\$)	City Cost (\$)
Subtotal for Vernal Pool Complex Monitoring and Management	19,970,611	10,391,193
Baseline HGM Hydrological Surveys	108,476	68,358
Fencing	441,681	170,954
Reporting	1,319,932	1,319,932
Changed Circumstances	4,489,780	4,489,780
Total Contingency	1,412,220	1,412,220
TOTAL IMPLEMENTATION COST FOR ALTERNATIVE 1	27,742,700	17,852,437

Note: Costs have been rounded to the nearest dollar and are detailed in Attachment A.

¹ Includes initial one-time costs for Level 2 and 3 complexes, plus ongoing costs for complexes at Level 1.

3.3 ADDITIONAL COSTS FOR ALTERNATIVE 2 – EXPANDED CONSERVATION

Alternative 2 conserves the same number of complexes and only twelve additional pools with focal species: four with plants and eight with shrimp. Therefore, the costs for Alternative 2 are only marginally higher when compared to the total cost of the Project.

The *additional* cost (one-time, annual, and total) associated with VPMMP implementation under Alternative 2 (for both recommended and required monitoring and management activities) compared to the Project is summarized below in Table 3-8. Table 3-8 only includes complexes under Alternative 2 that have additional vernal pools occupied with plant and/or shrimp focal species (Expanded Conservation) compared to the Project, because additional monitoring and management costs are tied directly to the number of focal species pools (not the total number of vernal pools). Complexes under Alternative 2 with additional vernal pools, but which do not

have additional *focal species* pools, are not included because there would be no additional cost for implementation. Refer to TWP 2 (AECOM 2012b) for a complete list of vernal pools conserved under Alternative 2.

The one-time costs for implementing the VPMMP under Alternative 2 is \$29,601 greater than compared to the Project. The estimated total annual cost for implementing the VPMMP under Alternative 2 is \$2,339 greater than for the Project. The total additional cost for the life of the Project (36 years) would be \$106,410 greater than for the Project. Note that the only additional focal species pools on City-controlled land are in complexes H 1-10, 13-15, 18-26 (Rhodes), and I 12 (Pueblo Lands); therefore, the City would only be responsible for additional costs associated with those pools for Alternative 2. The additional focal species pools on complexes H 1-10, 13-15, 18-26 (Del Mar Mesa State/Federal), J 13 E, and J 13 S are on private, federal, or state land (shown in grey in Table 3-8).

Table 3-8
Additional Annual Costs Associated with VPMMP Implementation for Alternative 2

Complex ID	Name	Additional Pools with Focal Plant Species	Additional Pools with Focal Shrimp Species	VPMMP Required Monitoring/Management Level ¹	Additional One-Time Cost for VPMMP Required Monitoring/Management	Additional Annual Cost for VPMMP Level 1 Monitoring/Management	Additional Total Cost for Alternative 2 (36 years)
H 1-10, 13-15, 18-26	Rhodes	0	3	SSMP	\$4,798	\$860	\$31,458
	Del Mar Mesa (State/ Federal)	2	2	SSMP	\$24,803	\$619	\$43,992
I 12	Pueblo Lands	0	3	Level 1	N/A	\$860	\$30,960
J 13 E	South Otay J 13 East	1	0	None	\$0	\$0	\$0
J 13 S	South Otay J 13 South	1	0	None	\$0	\$0	\$0
Total Additional		4	8	-	\$29,601	\$2,339	\$106,410
City Additional		0	6		\$4,798	\$1,720	\$62,418

Note: The grey rows indicate vernal pools on lands not under City control. Only additional focal species pools are listed in this table. Refer to TWP 2 for a complete list of vernal pools in Alternative 2.

¹ Required and recommended VPMMP monitoring and management levels are defined in Table A-5 of Attachment A. SSMP = Site-Specific Management Plan, equivalent to Level 3 monitoring and management costs (5-year period).

CHAPTER 4

REFERENCES

- AECOM. 2012a. Draft Technical White Paper 3 & 4: Adaptive Management and Monitoring Strategy for the City of San Diego Vernal Pool Habitat Conservation Plan. August.
- AECOM. 2012b. Draft Technical White Paper 2: Assessment of Focal Species Conservation for the City of San Diego Vernal Pool Habitat Conservation Plan. August.
- AECOM. 2012c. Draft Technical White Paper 6: Conditions of Coverage. August.
- Bauder, E. T. 1986. *San Diego Vernal Pools, Recent and Projected Losses; Their Condition; and Threats to Their Existence 1979–1990*, Volume 1. Endangered Plant Program, California Department of Fish and Game, Sacramento, California.
- Bauder, E. T., A. J. Bohonak, B. Hecht, M. A. Simovich, D. Shaw, D. G. Jenkins, and M. Rains. A Draft Regional Guidebook for Applying the Hydrogeomorphic Approach to Assessing Wetland Functions of Vernal Pool Depressional Wetlands in Southern California. December.
- City of San Diego. 2004. *City of San Diego Vernal Pool Inventory*. Planning Department, San Diego, California.
- Integra Reality Resources. 2009. Appraisal of Real Property for Vacant Mitigation Land. November.
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- Robertson, P. N. (Certified General Appraiser, State of California #AGOO8859). 2010. Summary Appraisal Report for Ramona Unified School District. March.
- San Diego Association of Governments (SANDAG Service Bureau). 2011. City of San Diego Vernal Pool Inventory Database. September.

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ATTACHMENT A

COST EVALUATION

Table A-1: Level 1 Monitoring and Management Costs

Table A-2: Level 2 Monitoring and Management Costs

Table A-3: Level 3 Monitoring and Management Costs

Table A-4: Other One-Time (Mandatory) and Potential As-Needed (Optional) Costs for VPHCP Preserve Monitoring and Management

Table A-5: City of San Diego VPHCP Preserve Monitoring and Management Comprehensive Cost Estimate by Complex for the Project

Table A-6: Summary of One-Time Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)

Table A-7: Summary of Annual Ongoing Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)

Table A-8: Summary of Total Costs for VPHCP Preserve Monitoring and Management by Complex for the 36-Year Life of the Project (2012 Dollars)

Table A-9: Weed Control Cost Estimate Detail

Table A-10: City and Consultant Staff 2012 Rates

Table A-11: Cost Estimate for Changed Circumstances

Table A-12: Fence and Sign Installation Cost Assumptions

Table A-13: City of San Diego VPHCP Preserve Monitoring and Management Comprehensive Cost Estimate by Complex for Alternative 1 (Baseline)

Table A-1: Level 1 Monitoring and Management Costs

Task	Assumptions	Staff	Title	Loaded Rate	Hours	Unit	Timing	Annual Cost per Unit
MONITORING LEVEL 1								
Qualitative Visits	2 hour per complex, including travel time	City	Bio III	\$91	2	Complex	Annual	\$182
Quantitative Floral Focal Species Surveys	0.5 hour per pool; survey 10% of pools with each focal species; if complex has <10 pools for each focal species, survey at least 1 pool for each focal species known to occur	City	Bio III	\$91	0.5	Pool (subsample)	Annual	\$45
Quantitative Shrimp Focal Shrimp Species Surveys	Dry season shrimp cyst sampling for pools with shrimp, up to 10 pools or 5% of pools, whichever is greater; sampling once every 3 years; includes genetic lab time for analyzing shrimp	Consultant	n/a	\$860 per pool	n/a	Pool (subsample)	Once every 3 years	\$287
Ponding Verification	4 hours per complex (includes 3 visits during wet season, one assumed to overlap with qualitative visit)	City	Bio I	\$65	4	Complex	Annual	\$259
MANAGEMENT LEVEL 1								
Patrol/Enforcement	Patrol and enforcement of site access throughout the year as part of stewardship (Average once per month, 4 hrs per visit including travel time. Note some complexes may not be visited every month and others may be visited bi-weekly or weekly)	City	Ranger	\$62	4	Complex	Ranges (Average Monthly)	\$2,959
Trash and Debris Removal	Performed in conjunction with other visits	City	GMM or Ranger ¹	\$68	16	Complex	Annual	\$1,091
Access Control Maintenance	Repair and maintenance of previously installed access control (e.g., fencing and signs). Material costs are included in the per unit cost (assume \$100 per complex).	City	GMM or Ranger+ Fence/Sign Cost	\$68	8	Complex	Annual	\$646
Edge Effect Repair	Irrigation control, erosion control, etc.	City	GMM or Ranger ¹	\$68	4	Complex	Annual	\$273
General Weed Control Level 1	Two visits per spring (2 staff) for general upland watershed area and non-focal species vernal pools	City	PA	\$60	32	Complex	Annual	\$1,932
Focal Vernal Pool Weed Control Level 1	Two visits per spring (1 staff) of targeted control of invasives in vernal pools with focal species	City	PA + Herbicide	\$67	16	Complex	Annual	\$1,066
Maintenance Oversight	Average of two 2 hour oversight visits/field coordination efforts per year	City	Snr Plnr	\$92	4	Complex	Annual	\$369

Notes: Level 1 activities apply to pools with focal species unless otherwise noted. Rates are rounded and detailed in Table A-7.

¹ For cost estimating purposes, the City GMM and Ranger rates are averaged

Summary Costs:	
Annual Cost for Complex-Wide Activities	\$8,778
Annual Cost for Each Floral Focal Species Pool in Subsample	\$45
Annual Cost for Each Shrimp Focal Species Pool in Subsample	\$287

Table A-2: Level 2 Monitoring and Management Costs

Task	Assumptions	Staff	Title	Loaded Rate	Hours	Unit	Timing	Annual Cost per Unit
MONITORING LEVEL 2								
Qualitative Visits	2 hour per complex, including travel time	City	Bio III	\$91	1.5	Complex	Annual	\$136
Quantitative Floral Focal Species Surveys	0.5 hour per pool. Survey all pools with focal species	City	Bio III	\$91	0.25	Pool	Annual	\$23
Quantitative Shrimp Focal Shrimp Species Surveys	Dry season shrimp cyst sampling for pools with shrimp, up to 10 pools or 10% of pools, whichever is greater; sampling once every 3 years; includes genetic lab time for analyzing shrimp	Consultant	n/a	\$860 per pool	n/a	Pool (subsample)	Once every 3 years	\$287
Ponding Verification	4 hours per complex (includes 3 visits during wet season, one assumed to overlap with qualitative visit)	City	Bio I	\$65	4	Complex	Annual	\$259
MANAGEMENT LEVEL 2								
Trash and Debris Removal	Performed in conjunction with other visits	City	GMM or Ranger ¹	\$68	16	Complex	Annual	\$1,091
Access Control Maintenance	Repair and maintenance of previously installed access control (e.g., fencing and signs). Material costs are included in the per unit cost (assume \$200 per complex)	City	GMM or Ranger + Fence/Sign	\$68	8	Complex	Annual	\$746
Edge Effect Repair	Irrigation control, erosion control, etc.	City	GMM or Ranger ¹	\$68	4	Complex	Annual	\$273
Maintenance Oversight	Assume average of 16 hours per complex annually (4 visits)	Consultant	Snr Bio	\$171	16	Complex	Annual	\$2,742
Dethatching	One time in pools with focal species and 20-foot buffer	Consultant	Crew	n/a	n/a	Pool	Annual	\$277
General Weed Control Level 2	Three visits per spring (2 staff) for general upland watershed area and non-focal species vernal pools	Consultant	Crew + Herbicide	\$66	48	Complex	Annual	\$3,180
Focal Vernal Pool Weed Control Level 2	Two visits per spring (4 staff) and 20-foot buffer around focal species pools only	Consultant	Crew	n/a	n/a	Pool	Annual	\$231
Seed Collection	Hand collection from pools with focal species	Consultant	Bio I	\$99	0.5	Pool	Annual	\$49
Seed Bulking	One greenhouse generation; 50 plants per pool with focal species	Consultant	n/a	\$7.50 per plant	n/a	Pool	Annual	\$375
Seed Dispersal	Hand broadcast in pools with focal species	Consultant	Crew	\$60	0.25	Pool	Annual	\$15
Shrimp Cyst Soil Collection	Performed by permitted biologist	Consultant	Bio I	\$99	0.5	Pool	Annual	\$49
Shrimp Cyst Soil Dispersal	Performed by permitted biologist	Consultant	Bio I	\$99	0.25	Pool	Annual	\$25
Topographic Repair	10 pools per day, including 8 hrs operator plus 8 hrs senior biologist, including maximum depth survey.	Consultant	Crew	\$60	8	Pool	Annual	\$98
			Snr Bio	\$171	8	Pool	Annual	\$137

Notes: Level 2 activities apply to pools with focal species unless otherwise noted. Rates are rounded and detailed in Table A-7.

Summary Costs:	
Annual Cost for Complex-Wide Activities	\$8,427
Annual Cost for Each Floral Focal Species Pool in Subsample	\$970
Annual Cost for Each Shrimp Focal Species Pool in Subsample	\$361
Topographic Repair	\$235

Table A-3: Level 3 Monitoring and Management Costs

Task	Assumptions	Staff	Title	Loaded Rate	Hours	Unit	Timing	Annual Cost per Unit
MONITORING LEVEL 3								
Qualitative Visits	2 hour per complex, including travel time	Consultant	Bio I	\$99	1.5	Complex	Annual	\$148
Quantitative Floral Focal Species Surveys	0.5 hour per pool; survey all pools with focal species	Consultant	Bio I	\$99	0.25	Pool	Annual	\$25
Quantitative Shrimp Focal Shrimp Species Surveys	Dry season shrimp cyst sampling for pools with shrimp, up to 10 pools or 20% of pools, whichever is greater; sampling once every 3 years; includes genetic lab time for analyzing shrimp	Consultant	n/a	\$860 per pool	n/a	Pool (subsample)	Once every 3 years	\$172
Ponding Verification	4 hours per complex (includes 3 visits during wet season, one assumed to overlap with qualitative visit)	Consultant	Bio I	\$99	4	Complex	Annual	\$394
MANAGEMENT LEVEL 3								
Trash and Debris Removal	Performed in conjunction with other visits	City	GMM or Ranger ¹	\$68	16	Complex	Annual	\$1,091
Access Control Maintenance	Repair and maintenance of previously installed access control (e.g., fencing and signs). Material costs are included in the per unit cost (assume \$200 per complex).	City	GMM or Ranger + Fence/Sign Cost	\$68	8	Complex	Annual	\$746
Edge Effect Repair	Irrigation control, erosion control, etc.	City	GMM or Ranger ¹	\$68	4	Complex	Annual	\$273
Maintenance Oversight	Assume 32 hours per complex annually (8 visits)	Consultant	Snr Bio	\$171	32	Complex	Annual	\$5,483
Dethatching	One time in pools with focal species and 35-foot buffer	Consultant	Crew	\$60	n/a	Pool	Annual	\$558
General Weed Control	Four visits per spring (2 staff) in general upland watershed and non-focal species vernal pools	Consultant	Crew + Herbicide	\$66	64	Complex	Annual	\$4,240
Focal Vernal Pool Weed Control Level 3	Four visits per spring (4 staff) and 35-foot buffer around pools with focal species only	Consultant	Crew	\$60	n/a	Pool	Annual	\$744
Seed Collection	Hand collection from pools with focal species	Consultant	Bio I	\$99	1	Pool	Annual	\$99
Seed Bulking	One greenhouse generation; 50 plants per pool with focal species	Consultant	n/a	\$7.50 per plant	n/a	Pool	Annual	\$375
Seed Dispersal	Hand broadcast in pools with focal species	Consultant	Crew	\$60	0.5	Pool	Annual	\$30
Container Plant Installation	Plants are directly planted into the site	Consultant	Crew	\$60	4	Pool	Annual	\$240
Container Plant Care	Includes 3 visits for watering (0.5 hour each), does not include water cost	Consultant	Crew	\$60	1.5	Pool	Annual	\$90
Shrimp Cyst Soil Collection	Performed by permitted biologist	Consultant	Bio I	\$99	1	Pool	Annual	\$99
Shrimp Cyst Soil Dispersal	Performed by permitted biologist	Consultant	Bio I	\$99	0.5	Pool	Annual	\$49
Topographic Repair	8 pools per day, including 8 hrs operator plus 8 hrs senior biologist, including maximum depth survey	Consultant	Crew	\$60	8	Pool	Annual	\$123
			Snr Bio	\$171	8	Pool	Annual	\$171

Notes: Level 3 activities apply to pools with focal species unless otherwise noted. Rates are rounded and detailed in Table A-7.

Summary Costs:	
Annual Cost for Complex-Wide Activities	\$12,375
Annual Cost for Each Floral Focal Species Pool in Subsample	\$2,160
Annual Cost for Each Shrimp Focal Species Pool in Subsample	\$320
Topographic Repair	\$294

Table A-4: Other One-Time (Mandatory) and Potential As-Needed (Optional) Costs for VPHCP Preserve Monitoring and Management

Task	Assumptions	Staff	Title	Loaded Rate	Hrs	Unit	Timing	Estimated Cost or Range of Costs
ONE-TIME MANDATORY COSTS (INCLUDED IN TABLE A-5)								
HGM Baseline Survey (City Lands)	Assume all pools in the VPHCP Preserve on City controlled lands (1,486 pools) will be surveyed within a 5 year timeframe. Data collection for Level 2 and 3 pools will be funded via the VPHCP, Level 1 pools will be funded via outside funding (e.g., grant)	Consultant	Bio I	\$99	0.5	Per Pool	One-Time	\$73,238
HGM Baseline Survey (Other Ownership)	Assume all pools in the VPHCP Preserve on privately owned/controlled lands (1,375 pools) will be surveyed within a 5 year timeframe	Consultant	Bio I	\$99	0.5	Per Pool	One-Time	\$67,767
Installing Fencing/Signage	Fencing and signage will be installed at certain complexes that do not have existing access control and require fencing/signs based on City direction (as detailed in Table A-12). Costs include materials plus City staff labor for installation.	City	GMM	\$75	N/A	Average Fence/Sign Installation Cost plus Labor per Linear Foot	One-Time	\$10.29
POTENTIAL AS-NEEDED OPTIONAL COSTS TO CONSIDER (NOT INCLUDED IN TABLE A-5)								
Management Level 1								
Topographic Repair Level 1	Minor as-needed repairs with hand tools	City	GMM	\$75	16	Complex	Annual	\$1,196
Management Level 2								
Detailed Restoration Plan	For internal use by City and Consultant staff to guide specific restoration activities; prepared at the discretion of the City	Consultant	Various	N/A	N/A	Per Plan	One-time	\$15,000 (1-20 pools)/ \$20,000 (21-50 pools)/ \$25,000 (51-100 pools)
Detailed Topographic Plan	Includes a detailed micro-topographic map to direct vernal pool restoration; prepared at the discretion of the City	Consultant	Various	N/A	N/A	Per Plan	One-time	\$3,500 (1-20 pools)/ \$7,500 (21-50 pools)/ \$10,000 (50+ pools)
Management Level 3								
Detailed Restoration Plan	For internal use by City and Consultant staff to guide specific restoration activities; prepared at the discretion of the City	Consultant	Various	N/A	N/A	Per Plan	One-time	\$5000 (1-20 pools)/ \$7500 (21-50 pools)/ \$10,000 (51-100 pools)
Detailed Topographic Plan	For internal use by City and Consultant staff, includes a detailed micro-topographic map to direct vernal pool restoration; prepared at the discretion of the City	Consultant	Various	N/A	N/A	Per Plan	One-time	\$3,500 (1-20 pools)/ \$7,500 (21-50 pools)/ \$10,000 (50+ pools)

Notes: Rates are detailed in Table A-7.

Table A-5 City of San Diego VPHCP Preserve Monitoring and Management Comprehensive Cost Estimate by Complex for the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Plant Focal Species Pools Subsample (Level 1)	Pools with Plant Focal Species (Level 2)	Pools with Plant Focal Species (Level 3)	Total Pools with Shrimp Focal Species	Shrimp Focal Species Pool Subsample (Level 1)	Shrimp Focal Species Pool Subsample (Level 2)	Shrimp Focal Species Pool Subsample (Level 3)	% City Controlled Pools	Total One-Time Fence/Sign Installation Cost	City One-Time Fence/Sign Installation Cost	Total Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	City Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	Required VPMMP Mngmt & Monitoring Level	Total One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	City One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	Recommended VPMMP Mngmt & Monitoring Level	Total One-Time Cost for Recommended VPMMP Mngmt & Monitoring Level (\$)	City One-Time Cost for Recommended VPMMP Mngmt & Monitoring Level (\$)	Total Cost for VPMMP Implementation (36 Years)	City Cost for Required VPMMP Implementation (36 Years)
B 11	Mesa Norte	North	Private	16	2	16	16	24	10	10	10	0	0	0	11,735	0	Level 1	0	0	None	0	0	422,475	0
B 5	Tierra Alta	North	Private	0	0	0	0	0	0	0	0	0	1,915	0	8,778	0	SSMP	61,876	0	None	0	0	333,988	0
B 6	Lopez Ridge (CDFG)	North	State	1	1	1	1	0	0	0	0	0	0	0	8,823	0	Level 1	0	0	None	0	0	317,638	0
B 7-8	Crescent Heights	North	City	1	1	1	1	0	0	0	0	100	0	0	8,823	8,823	Level 1	0	0	SSA	28,898	28,898	317,638	317,638
	Lopez Ridge (City)	North	City	10	2	10	10	2	2	2	2	100	0	0	9,442	9,442	Level 1	0	0	SSA	60,078	60,078	339,915	339,915
C 10-16	Winterwood	North	School District	27	4	27	27	2	2	2	2	0	0	0	9,533	0	SSMP	378,779	0	None	0	0	674,303	0
C 17-18	Fieldstone	North	Private	8	1	8	8	0	0	0	0	0	0	0	8,823	0	None ₂	0	0	Level 1	28,599	0	0	0
C 27	Mira Mesa Market Center	North	Private	1	1	1	1	1	1	1	1	0	0	0	9,110	0	None	0	0	None	0	0	0	0
D 5-8	Parkdale Carroll Canyon	North	City	0	0	0	0	0	0	0	0	100	0	0	8,778	8,778	Level 1	0	0	None	0	0	316,001	316,001
	Carroll Canyon	North	City	76	11	76	76	5	5	5	5	100	0	0	10,711	10,711	Level 1	0	0	None	0	0	385,608	385,608
F 16-17	Menlo KM Parcel	Central	Private	0	0	0	0	1	1	1	1	0	0	0	9,064	0	None ₁	0	0	Level 2	27,069	0	0	0
H 1-10, 13-15,18 23, 24-26	Del Mar Mesa (State/Federal)	North	State/Federal	154	18	154	154	10	10	10	10	0	0	0	12,463	0	SSMP	1,778,177	0	None	0	0	2,164,530	0
	Del Mar Mesa (Private)	North	Private	2	1	2	2	1	1	1	1	0	13,752	0	9,110	0	None	SSMP 88,019	0	None	0	0	370,427	0
	Del Mar Mesa (City/County)	North	City and County	64	7	64	64	8	8	8	8	84	31,384	26,489	11,389	9,613	SSMP	802,758	677,557	None	0	0	1,155,831	975,564
	Rhodes	North	Private	12	2	12	12	4	4	4	4	0	0	0	10,015	0	SSMP (pending approval)	212,595	0	None	0	0	523,073	0
H 17	Shaw Lorenz	North	Private	0	0	0	0	1	1	1	1	0	0	0	9,064	0	SSMP	64,945	0	None	0	0	345,943	0
H 33	East Ocean Air Drive	North	Private	2	1	2	2	0	0	0	0	0	4,704	0	8,823	0	None ₂	0	0	Level 2	31,103	0	0	0
H 38	Carmel Mountain	North	City	0	0	0	0	2	2	2	2	100	0	0	9,351	9,351	SSMP	68,013	68,013	Level 2	28,856	28,856	357,898	357,898
H 39	Greystone Torrey Highlands	North	City	6	2	6	6	0	0	0	0	100	0	0	8,869	8,869	Level 1	0	0	None	0	0	319,275	319,275
I 1	Arjons	North	Private	25	4	25	25	1	1	1	1	0	0	0	9,246	0	None ₂	0	0	None (Legal access and easement)	0	0	0	0
I12	Pueblo Lands	North	City Enterprise	0	0	0	0	2	2	2	2	100	12,197	12,197	9,351	9,351	Level 1	0	0	Level 3	68,013	68,013	336,641	336,641
I 6 B	Ford Leasing (Bob Baker)	North	Private	1	1	1	1	3	3	3	3	0	0	0	9,683	0	None ₂	0	0	Level 2	32,143	0	0	0
I 6 C	Facilities Development (Eastgate Miramar Associates)	North	Private	11	2	11	11	6	6	6	6	0	0	0	10,589	0	None ₂	0	0	Level 2	67,316	0	0	0
J 11 E	Slump Block Pools	South	Private	0	0	0	0	0	0	0	0	0	12,146	0	8,778	0	None ₁	0	0	Level 3	61,876	0	0	0
J 11 W	J 11 West	South	Private	0	0	0	0	1	1	1	1	0	21,750	0	9,064	0	None ₁	0	0	Level 3	64,945	0	0	0
J 12	J 12	South	Private	0	0	0	0	0	0	0	0	0	14,575	0	8,778	0	None ₁	0	0	Level 3	61,876	0	0	0
J 13 E	South Otay J 13 East	South	Private	0	0	0	0	0	0	0	0	0	16,963	0	8,778	0	None ₁	0	0	Level 3	61,876	0	0	0
J 13 N	South Otay 1 acre (private)	South	Private	0	0	0	0	0	0	0	0	0	0	0	8,778	0	None ₁	0	0	Level 3	61,876	0	0	0
	South Otay 1 acre (City)	South	City	3	3	3	3	0	0	0	0	100	25,877	25,877	8,914	8,914	None	0	0	Level 3	98,691	98,691	0	0
J 13 S	South Otay J 13 South	South	Private	6	1	6	6	0	0	0	0	0	58,867	0	8,823	0	None ₁	0	0	Level 3	135,506	0	0	0
	Bachman	South	Private	0	0	0	0	0	0	0	0	0	2,090	0	8,778	0	None ₁	0	0	Level 3	61,876	0	0	0
J 14	Anderprises (Caltrans)	South	State	2	2	2	2	7	7	7	7	0	55,182	0	10,875	0	SSMP	107,899	0	None	0	0	445,037	0
	Anderprises (City)	South	City	0	0	0	0	0	0	0	0	100	2,326	2,326	8,778	8,778	None	0	0	None	0	0	316,001	316,001
	Cal Terraces (South)	South	City	63	14	63	63	36	10	10	10	100	0	0	12,281	12,281	Level 1	0	0	None	0	0	442,119	442,119
	Handler	South	Private	0	0	0	0	0	0	0	0	0	23,149	0	8,778	0	SSMP	61,876	0	None	0	0	333,988	0
	Bachman	South	Private	0	0	0	0	0	0	0	0	0	0	0	8,778	0	Level 1	0	0	Level 3	61,876	0	316,001	0
J 15	Arnie's Point	South	Federal	62	10	62	62	57	10	10	11	62	0	0	12,099	0	SSMP	763,912	0	None	0	0	1,138,988	0
J 16-18	Goat Mesa (Federal)	South	Federal	0	0	0	0	0	0	0	0	0	6,598	0	8,778	0	None	0	0	None	0	0	0	0
	Goat Mesa (Private)	South	Private	0	0	0	0	0	0	0	0	0	2,265	0	8,778	0	None ₁	0	0	Level 2	25,282	0	0	0
	Goat Mesa (City)	South	City	4	1	4	4	0	0	0	0	100	0	0	8,823	8,823	Level 2	38,335	38,335	None	0	0	329,503	329,503
	Wruck Canyon	South	City Enterprise	0	0	0	0	0	0	0	0	100	10,118	10,118	8,778	8,778	Level 2	25,282	25,282	None	0	0	314,950	314,950
J 2	Cal Terraces (North), Otay Mesa Road Parcels	South	City	219	70	219	219	216	11	22	43	100	0	0	15,057	15,057	Level 1	0	0	None	0	0	542,050	542,050
	Clayton Parcel	South	City	1	1	1	1	0	0	0	0	100	54,328	54,328	8,823	8,823	Level 1	0	0	Level 3	74,148	74,148	317,638	317,638
	St. Jerome's	South	Private	0	0	0	0	0	0	0	0	0	14,061	0	8,778	0	None ₁	0	0	Level 3	61,876	0	0	0
J 20-21	La Media ITS	South	Private	0	0	0	0	6	6	6	6	0	65,403	0	10,498	0	None ₁	0	0	Level 3	80,287	0	0	0
J 21	La Media Swale South	South	Private	0	0	0	0	0	0	0	0	0	16,778	0	8,778	0	None ₁	0	0	Level 3	61,876	0	0	0
J 27	Empire Center	South	Private	9	1	9	9	0	0	0	0	0	8,358	0	8,823	0	None ₂	0	0	Level 1	26,470	0	0	0
J 28 E	La Media Swale North	South	Private	0	0	0	0	0	0	0	0	0	13,958	0	8,778	0	None ₁	0	0	Level 3	61,876	0	0	0
J 29	Lonestar W (Caltrans)	South	State	9	1	9	9	1	1	1	1	0	0	0	9,110	0	SSMP	175,390	0	None	0	0	457,798	0
J 30	Lonestar E (Caltrans)	South	State	0	0	0	0	70	10	10	14	0	0	0	11,644	0	SSMP	120,997	0	None	0	0	481,976	0
	Lonestar E (Private)	South	Private	33	4	33	33	0	0	0	0	0	0	0	8,960	0	SSMP	440,396	0	Level 2	131,911	0	718,146	0
J 31	Dennery West	South	State	0	0	0	0	38	10	10	10	0	0	0	11,644	0	SSMP	77,869	0	None	0	0	438,847	0
	Hidden Trails **	South	City	0	0	0	0	1	1	1	1	100	0	0	9,064	9,064	Level 2	27,774	27,774	None	0	0	326,902	326,902

Table A-5 City of San Diego VPHCP Preserve Monitoring and Management Comprehensive Cost Estimate by Complex for the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Plant Focal Species Subsample (Level 1)	Pools with Plant Focal Species (Level 2)	Pools with Plant Focal Species (Level 3)	Total Pools with Shrimp Focal Species	Shrimp Focal Species Pool Subsample (Level 1)	Shrimp Focal Species Pool Subsample (Level 2)	Shrimp Focal Species Pool Subsample (Level 3)	% City Controlled Pools	Total One-Time Fence/Sign Installation Cost	City One-Time Fence/Sign Installation Cost	Total Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	City Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	Required VPMMP Mngmt & Monitoring Level	Total One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	City One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	Recommended VPMMP Mngmt & Monitoring Level	Total One-Time Cost for Recommended VPMMP Mngmt & Monitoring Level (\$)	City One-Time Cost for Recommended VPMMP Mngmt & Monitoring Level (\$)	Total Cost for VPMMP Implementation (36 Years)	City Cost for Required VPMMP Implementation (36 Years)	
J 32	West Otay A	South	State	15	3	15	15	9	9	9	9	0	32,753	0	11,494	0	SSMP	252,999	0	None	0	0	609,320	0	
	West Otay B	South	City	0	0	0	0	0	0	0	0	100	11,796	11,796	8,778	8,778	SSMP	61,876	61,876	None	0	0	333,988	333,988	
	West Otay C	South	City	1	1	1	1	0	0	0	0	100	9,933	9,933	8,823	8,823	Level 1	0	0	Level 2	28,898	28,898	317,638	317,638	
J 33	Sweetwater High School	South	School District	7	3	7	7	8	8	8	8	0	0	0	11,208	0	SSMP	150,287	0	None	0	0	497,722	0	
J 34	Bachman	South	Private	0	0	0	0	0	0	0	0	0	21,636	0	8,778	0	None ₁	0	0	Level 3	61,876	0	0	0	
	Candlelight	South	Private	0	0	0	0	1	1	1	1	0	45,208	0	9,064	0	SSMP	63,475	0	None	0	0	344,474	0	
J 35	Brown Field	South	City Enterprise	0	0	0	0	0	0	0	0	100	0	0	8,778	8,778	Level 3	61,876	61,876	None	0	0	333,988	333,988	
J 36	Southview	South	Private	0	0	0	0	12	10	10	10	0	29,192	0	11,644	0	None ₁	0	0	Level 3	95,500	0	0	0	
J 4	Robinhood Ridge	South	City	50	8	50	50	41	10	10	10	100	0	0	12,008	12,008	Level 1	0	0	Level 2	188,683	188,683	432,297	432,297	
	California Crossing	South	Private	0	0	0	0	5	5	5	5	0	13,618	0	10,211	0	None (reporting)	0	0	Level 3	69,872	0	0	0	
K 5	Otay Lakes	Central	City Enterprise	46	6	46	46	6	6	6	6	100	0	0	10,771	10,771	Level 1	0	0	None	0	0	387,743	387,743	
KK 2	Pasatiempo	Central	City	0	0	0	0	0	0	0	0	100	14,235	14,235	8,778	8,778	None	0	0	None	0	0	0	0	
MM 1	Marron Valley	South	City Enterprise	0	0	0	0	5	5	5	5	100	0	0	10,211	10,211	Level 2	32,101	32,101	None	0	0	369,069	369,069	
N 1-4	Teledyne Ryan	Central	Private	1	1	1	1	11	10	10	10	0	0	0	11,690	0	None ₁	0	0	Level 2	46,063	0	0	0	
N 5-6	Montgomery Field	Central	City Enterprise	129	13	129	129	10	10	10	10	100	0	0	12,236	12,236	Level 1	0	0	None	0	0	440,482	440,482	
N 7	Serra Mesa Library	Central	City	0	0	0	0	0	0	0	0	100	0	0	8,778	8,778	Level 1	0	0	SSA	25,000	25,000	316,001	316,001	
N 8	General Dynamics **	Central	City	20	3	20	20	6	6	6	6	100	0	0	10,634	10,634	Level 1	0	0	None	0	0	382,832	382,832	
NC	Li Collins	North	Private	0	0	0	0	0	0	0	0	0	0	0	8,778	0	None	0	0	SSA	25,282	0	0	0	
	Kelton	South	City	0	0	0	0	0	0	0	0	100	0	0	8,778	8,778	None	0	0	SSA	No actions identified	0	0	0	
OO	Salk Institute	North	Private	0	0	0	0	0	0	0	0	0	0	0	8,778	0	SSMP	61,876	0	SSA	0 (education only)	0	333,988	0	
Q2	Mission Trails Regional Park School District	Central	School District	0	0	0	0	0	0	0	0	0	3,088	0	8,778	0	None ₁	0	0	Level 3	61,876	0	0	0	
	Mission Trails Regional Park	Central	City	0	0	0	0	6	6	6	6	100	0	0	10,498	10,498	SSMP	78,818	78,818	Level 2	35,299	35,299	404,250	404,250	
Q 3	Castlerock	North	Private	0	0	0	0	0	0	0	0	0	0	0	8,778	0	SSMP	61,876	0	None	0	0	333,988	0	
QQ	Tecolote Canyon	Central	City	0	0	0	0	0	0	0	0	100	17,890	17,890	8,778	8,778	None	0	0	None	0	0	0	0	
R 1	Proctor Valley	South	City Enterprise	0	0	0	0	3	3	3	3	100	0	0	9,638	9,638	Level 1	0	0	None	0	0	346,961	346,961	
U15	SANDER	Central	City Enterprise	1	1	1	1	2	2	2	2	100	60,658	60,658	9,397	9,397	Level 1	0	0	None	0	0	338,278	338,278	
U 19	Cubic	Central	Private	3	2	3	3	6	6	6	6	0	39,042	0	10,589	0	None ₁	0	0	Level 3	111,225	0	0	0	
X 5	Nobel Drive	North	City	1	1	1	1	6	6	6	6	100	0	0	10,543	10,543	Level 1	0	0	None	0	0	379,558	379,558	
X 7	Nobel Research **	North	City	0	0	0	0	1	1	1	1	100	0	0	9,064	9,064	Level 1	0	0	Level 1	27,193	27,193	326,321	326,321	
Subtotal VPMMP Monitoring and Management Cost																795,251	321,947		6,120,077	1,071,633		2,342,967	663,757	22,830,025	11,047,109
Data Tracking and Reporting (Bio III 1 day per week annually, City responsibility for all sites)																36,665	36,665							1,319,932	1,319,932
Changed Circumstances (refer to Table A-11 for detail, assumes City is responsible for all costs)																137,890	137,890							4,964,040	4,964,040
Contingency 13.3% Annually (refer to TWP 5 Section 3.1.3 for details)																42,832	42,832							1,541,966	1,541,966
Total One-Time Fence/Sign Installation Cost (only certain complexes, as detailed in Table A-12)																								787,790	245,848
One-Time Cost for Vernal Pool HGM Baseline Survey (see Table A-4 for detail)																								141,004	73,238
TOTAL COST														787,790	245,848	1,012,638	539,335		6,120,077	1,071,633		2,342,967	663,757	31,584,758	19,192,132
		= Land not owned by City of San Diego.			= Land not owned by City of San Diego or under the City of San Diego's land use authority.																				

SSMP = Site-specific Management Plan, not part of VPMMP. For cost-estimating purposes, Level 3 costs are assumed.

SSA = Site-Specific Action, costs is based on specific actions specified in TWP 3&4 VPMMP Attachment A

None₁ = These sites are privately held and may seek development entitlement in the future. During the development entitlement process the City will ensure the property owner implements the Recommended Management.

None₂ = These site have been developed pursuant to prior approval by City of San Diego. No management was required at that time, nor is any management being required as part of this HCP. As funding becomes available the City may work with the owner to implement the Additional Recommended Management.

* = One-time costs are assumed for a 3-year period for monitoring and management for VPMMP-required Level 2 and 5-years for Level 3. After the initial 3 or 5-years, all complexes are assumed at the annual ongoing Level 1 cost. Sites at Level 1 are NOT included in this column as they are part of the on-going annual costs.

** = Development projects were approved on these three sites after the adoption of the City of San Diego’s Multiple Species Conservation Plan (MSCP). The City was granted a Conservation Easement as a condition of the discretionary land use entitlement. While the ownership is private, the City committed to provide the biological management of these sites as a condition easement pursuant to the requirements of the IMSCP.

Note: There are 146 vernal pools that are OUTSIDE the Vernal Pool HCP Preserve and SUBJECT to City Jurisdiction. Those 146 vernal pools are NOT included in this table and are proposed to be lost to development if the City's Vernal Pool HCP is adopted. Therefore no monitoring or management will be implemented by the City for those 146 pools under the HCP.

City Enterprise Sites		Department
I12	Pueblo Lands	Public Utilities Waste Water Department
J 16-18	Wruck Canyon	Public Utilities Waste Water Department
J 35	Brown Field	Airports
K 5	Otay Lakes	Public Utilities Water Department
MM 1	Marron Valley	Public Utilities Water Department
N 5-6	Montgomery Field	Airports
R 1	Proctor Valley	Public Utilities
U15	SANDER	Environmental Services

Table A-6: Summary of One-Time Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total One-Time Fence/Sign Installation Cost	City One-Time Fence/Sign Installation Cost	Required VPMMP Mngmt & Monitoring Level	Total One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	City One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)
B 11	Mesa Norte	North	Private	16	24	0	0	0	Level 1	0	0
B 5	Tierra Alta	North	Private	0	0	0	1,915	0	SSMP	61,876	0
B 6	Lopez Ridge (CDFG)	North	State	1	0	0	0	0	Level 1	0	0
B 7-8	Crescent Heights	North	City	1	0	100	0	0	Level 1	0	0
	Lopez Ridge (City)	North	City	10	2	100	0	0	Level 1	0	0
C 10-16	Winterwood	North	School District	27	2	0	0	0	SSMP	378,779	0
C 17-18	Fieldstone	North	Private	8	0	0	0	0	None ₂	0	0
C 27	Mira Mesa Market Center	North	Private	1	1	0	0	0	None	0	0
D 5-8	Parkdale Carroll Canyon	North	City	0	0	100	0	0	Level 1	0	0
	Carroll Canyon	North	City	76	5	100	0	0	Level 1	0	0
F 16-17	Menlo KM Parcel	Central	Private	0	1	0	0	0	None ₁	0	0
H 1-10, 13, 15, 18-23, 24-26	Del Mar Mesa (State/Federal)	North	State/Federal	154	10	0	0	0	SSMP	1,778,177	0
	Del Mar Mesa (Private)	North	Private	2	1	0	13,752	0	SSMP	88,019	0
	Del Mar Mesa (City/County)	North	City and County	64	8	84	31,384	26,489	SSMP	802,758	677,557
	Rhodes	North	Private	12	4	0	0	0	SSMP (pending approval)	212,595	0
H 17	Shaw Lorenz	North	Private	0	1	0	0	0	SSMP	64,945	0
H 33	East Ocean Air Drive	North	Private	2	0	0	4,704	0	None ₂	0	0
H 38	Carmel Mountain	North	City	0	2	100	0	0	SSMP	68,013	68,013
H 39	Greystone Torrey Highlands	North	City	6	0	100	0	0	Level 1	0	0
I 1	Arjons	North	Private	25	1	0	0	0	None ₂	0	0
I12	Pueblo Lands	North	City	0	2	100	0	0	Level 1	0	0
I 6 B	Ford Leasing (Bob Baker)	North	Private	1	3	0	0	0	None ₂	0	0
I 6 C	Facilities Development (Eastgate Miramar Associates)	North	Private	11	6	0	12,197	0	None ₂	0	0
J 11 E	Slump Block Pools	South	Private	0	0	0	12,146	0	None ₁	0	0
J 11 W	J 11 West	South	Private	0	1	0	21,750	0	None ₁	0	0
J 12	J 12	South	Private	0	0	0	14,575	0	None ₁	0	0
J 13 E	South Otay J 13 East	South	Private	0	0	0	16,963	0	None ₁	0	0
J 13 N	South Otay 1 acre (private)	South	Private	0	0	0	25,877	0	None ₁	0	0
	South Otay 1 acre (City)	South	City	3	0	100	0	0	None	0	0

Table A-6: Summary of One-Time Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total One-Time Fence/Sign Installation Cost	City One-Time Fence/Sign Installation Cost	Required VPMMP Mngmt & Monitoring Level	Total One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	City One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)
J 13 S	South Otay J 13 South	South	Private	6	0	0	58,867	0	None ₁	0	0
	Bachman	South	Private	0	0	0	2,090	0	None ₁	0	0
J 14	Anderprises (Caltrans)	South	State	2	7	0	55,182	0	SSMP	107,899	0
	Anderprises (City)	South	City	0	0	100	2,326	2,326	None	0	0
	Cal Terraces (South)	South	City	63	36	100	0	0	Level 1	0	0
	Handler	South	Private	0	0	0	0	0	SSMP	61,876	0
	Bachman	South	Private	0	0	0	6,598	0	Level 1	0	0
J 15	Arnie's Point	South	Federal	62	57	0	2,265	0	SSMP	763,912	0
J 16-18	Goat Mesa (Federal)	South	Federal	0	0	0	0	0	None	0	0
	Goat Mesa (Private)	South	Private	0	0	0	10,118	0	None ₁	0	0
	Goat Mesa (City)	South	City	4	0	100	23,149	23,149	Level 2	38,335	38,335
	Wruck Canyon	South	City	0	0	100	0	0	Level 2	25,282	25,282
J 2	Cal Terraces (North), Otay Mesa Road Parcels	South	City	219	216	100	0	0	Level 1	0	0
	Clayton Parcel	South	City	1	0	100	65,403	65,403	Level 1	0	0
	St. Jerome's	South	Private	0	0	0	16,778	0	None ₁	0	0
J 20-21	La Media ITS	South	Private	0	6	0	8,358	0	None ₁	0	0
J 21	La Media Swale South	South	Private	0	0	0	13,958	0	None ₁	0	0
J 27	Empire Center	South	Private	9	0	0	0	0	None ₂	0	0
J 28 E	La Media Swale North	South	Private	0	0	0	54,328	0	None ₁	0	0
J 29	Lonestar W (Caltrans)	South	State	9	1	0	0	0	SSMP	175,390	0
J 30	Lonestar E (Caltrans)	South	State	0	70	0	0	0	SSMP	120,997	0
	Lonestar E (Private)	South	Private	33	0	0	0	0	SSMP	440,396	0
J 31	Dennery West	South	State	0	38	0	32,753	0	SSMP	77,869	0
	Hidden Trails **	South	City	0	1	100	0	0	Level 2	27,774	27,774
J 32	West Otay A	South	State	15	9	0	11,796	0	SSMP	252,999	0
	West Otay B	South	City	0	0	100	0	0	SSMP	61,876	61,876
	West Otay C	South	City	1	0	100	9,933	9,933	Level 1	0	0
J 33	Sweetwater High School	South	School District	7	8	0	21,636	0	SSMP	150,287	0
J 34	Bachman	South	Private	0	0	0	45,208	0	None ₁	0	0
	Candlelight	South	Private	0	1	0	0	0	SSMP	63,475	0
J 35	Brown Field	South	City	0	0	100	29,192	29,192	Level 3	61,876	61,876
J 36	Southview	South	Private	0	12	0	14,061	0	None ₁	0	0

Table A-6: Summary of One-Time Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total One-Time Fence/Sign Installation Cost	City One-Time Fence/Sign Installation Cost	Required VPMMP Mngmt & Monitoring Level	Total One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	City One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)
J 4	Robinhood Ridge	South	City	50	41	100	0	0	Level 1	0	0
	California Crossing	South	Private	0	5	0	0	0	None (reporting)	0	0
K 5	Otay Lakes	Central	City	46	6	100	14,235	14,235	Level 1	0	0
KK 2	Pasatiempo	Central	City	0	0	100	0	0	None	0	0
MM 1	Marron Valley	South	City	0	5	100	0	0	Level 2	32,101	32,101
N 1-4	Teledyne Ryan	Central	Private	1	11	0	0	0	None ₁	0	0
N 5-6	Montgomery Field	Central	City	129	10	100	0	0	Level 1	0	0
N 7	Serra Mesa Library	Central	City	0	0	100	0	0	Level 1	0	0
N 8	General Dynamics **	Central	City	20	6	100	0	0	Level 1	0	0
NC	Li Collins	North	Private	0	0	0	0	0	None	0	0
	Kelton	South	City	0	0	100	3,088	3,088	None	0	0
OO	Salk Institute	North	Private	0	0	0	0	0	SSMP	61,876	0
Q2	Mission Trails Regional Park School District	Central	School District	0	0	0	3,088	0	None₁	0	0
	Mission Trails Regional Park	Central	City	0	6	100	0	0	SSMP	78,818	78,818
Q 3	Castlerock	North	Private	0	0	0	17,890	0	SSMP	61,876	0
QQ	Tecolote Canyon	Central	City	0	0	100	0	0	None	0	0
R 1	Proctor Valley	South	City	0	3	100	39,042	39,042	Level 1	0	0
U15	SANDER	Central	City	1	2	100	60,658	60,658	Level 1	0	0
U 19	Cubic	Central	Private	3	6	0	0	0	None ₁	0	0
X 5	Nobel Drive	North	City	1	6	100	0	0	Level 1	0	0
X 7	Nobel Research **	North	City	0	1	100	13,618	13,618	Level 1	0	0
Subtotal VPMMP Required Monitoring and Management Cost										6,120,077	1,071,633
Total One-Time Fence/Sign Installation Cost (only certain complexes, as detailed in Table A-12)										787,790	245,848
One-Time Vernal Pool HGM Baseline Survey (see Table A-4 for detail)										141,004	73,238
TOTAL ONE-TIME COST										7,048,872	1,390,718

= Land not owned by City of San Diego.

Bold

= Land not owned by City of San Diego or under the City of San Diego's land use authority

Table A-7 Summary of Annual Ongoing Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	City Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)
B 11	Mesa Norte	North	Private	16	24	0	11,735	0
B 5	Tierra Alta	North	Private	0	0	0	8,778	0
B 6	Lopez Ridge (CDFG)	North	State	1	0	0	8,823	0
B 7-8	Crescent Heights	North	City	1	0	100	8,823	8,823
	Lopez Ridge (City)	North	City	10	2	100	9,442	9,442
C 10-16	Winterwood	North	School District	27	2	0	9,533	0
C 17-18	Fieldstone	North	Private	8	0	0	8,823	0
C 27	Mira Mesa Market Center	North	Private	1	1	0	9,110	0
D 5-8	Parkdale Carroll Canyon	North	City	0	0	100	8,778	8,778
	Carroll Canyon	North	City	76	5	100	10,711	10,711
F 16-17	Menlo KM Parcel	Central	Private	0	1	0	9,064	0
H 1-10, 13-15, 18-23, 24-26	Del Mar Mesa (State/Federal)	North	State/Federal	154	10	0	12,463	0
	Del Mar Mesa (Private)	North	Private	2	1	0	9,110	0
	Del Mar Mesa (City/County)	North	City and County	64	8	84	11,389	9,613
	Rhodes	North	Private	12	4	0	10,015	0
H 17	Shaw Lorenz	North	Private	0	1	0	9,064	0
H 33	East Ocean Air Drive	North	Private	2	0	0	8,823	0
H 38	Carmel Mountain	North	City	0	2	100	9,351	9,351
H 39	Greystone Torrey Highlands	North	City	6	0	100	8,869	8,869
I 1	Arjons	North	Private	25	1	0	9,246	0
I 12	Pueblo Lands	North	City	0	2	100	9,351	9,351
I 6 B	Ford Leasing (Bob Baker)	North	Private	1	3	0	9,683	0
I 6 C	Facilities Development (Eastgate Miramar Associates)	North	Private	11	6	0	10,589	0
J 11 E	Slump Block Pools	South	Private	0	0	0	8,778	0
J 11 W	J 11 West	South	Private	0	1	0	9,064	0
J 12	J 12	South	Private	0	0	0	8,778	0
J 13 E	South Otay J 13 East	South	Private	0	0	0	8,778	0
J 13 N	South Otay 1 acre (private)	South	Private	0	0	0	8,778	0
	South Otay 1 acre (City)	South	City	3	0	100	8,914	8,914
J 13 S	South Otay J 13 South	South	Private	6	0	0	8,823	0
	Bachman	South	Private	0	0	0	8,778	0
J 14	Anderprises (Caltrans)	South	State	2	7	0	10,875	0
	Anderprises (City)	South	City	0	0	100	8,778	8,778
	Cal Terraces (South)	South	City	63	36	100	12,281	12,281
	Handler	South	Private	0	0	0	8,778	0
	Bachman	South	Private	0	0	0	8,778	0
J 15	Arnie's Point	South	Federal	62	57	0	12,099	0
J 16-18	Goat Mesa (Federal)	South	Federal	0	0	0	8,778	0
	Goat Mesa (Private)	South	Private	0	0	0	8,778	0
	Goat Mesa (City)	South	City	4	0	100	8,823	8,823
	Wruck Canyon	South	City	0	0	100	8,778	8,778
J 2	Cal Terraces (North), Otay Mesa Road Parcels	South	City	219	216	100	15,057	15,057
	Clayton Parcel	South	City	1	0	100	8,823	8,823
	St. Jerome's	South	Private	0	0	0	8,778	0
J 20-21	La Media ITS	South	Private	0	6	0	10,498	0
J 21	La Media Swale South	South	Private	0	0	0	8,778	0
J 27	Empire Center	South	Private	9	0	0	8,823	0
J 28 E	La Media Swale North	South	Private	0	0	0	8,778	0
J 29	Lonestar W (Caltrans)	South	State	9	1	0	9,110	0
J 30	Lonestar E (Caltrans)	South	State	0	70	0	11,644	0
	Lonestar E (Private)	South	Private	33	0	0	8,960	0
J 31	Dennery West	South	State	0	38	0	11,644	0
	Hidden Trails **	South	City	0	1	100	9,064	9,064
J 32	West Otay A	South	State	15	9	0	11,494	0
	West Otay B	South	City	0	0	100	8,778	8,778
	West Otay C	South	City	1	0	100	8,823	8,823
J 33	Sweetwater High School	South	School District	7	8	0	11,208	0

Table A-7 Summary of Annual Ongoing Costs for VPHCP Preserve Monitoring and Management by Complex for the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	City Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)
J 34	Bachman	South	Private	0	0	0	8,778	0
	Candlelight	South	Private	0	1	0	9,064	0
J 35	Brown Field	South	City	0	0	100	8,778	8,778
J 36	Southview	South	Private	0	12	0	11,644	0
J 4	Robinhood Ridge	South	City	50	41	100	12,008	12,008
	California Crossing	South	Private	0	5	0	10,211	0
K 5	Otay Lakes	Central	City	46	6	100	10,771	10,771
KK 2	Pasatiempo	Central	City	0	0	100	8,778	8,778
MM 1	Marron Valley	South	City	0	5	100	10,211	10,211
N 1-4	Teledyne Ryan	Central	Private	1	11	0	11,690	0
N 5-6	Montgomery Field	Central	City	129	10	100	12,236	12,236
N 7	Serra Mesa Library	Central	City	0	0	100	8,778	8,778
N 8	General Dynamics **	Central	City	20	6	100	10,634	10,634
NC	Li Collins	North	Private	0	0	0	8,778	0
	Kelton	South	City	0	0	100	8,778	8,778
OO	Salk Institute	North	Private	0	0	0	8,778	0
Q2	<i>Mission Trails Regional Park School District</i>	<i>Central</i>	<i>School District</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>8,778</i>	<i>0</i>
	Mission Trails Regional Park	Central	City	0	6	100	10,498	10,498
Q 3	Castlerock	North	Private	0	0	0	8,778	0
QQ	Tecolote Canyon	Central	City	0	0	100	8,778	8,778
R 1	Proctor Valley	South	City	0	3	100	9,638	9,638
U15	SANDER	Central	City	1	2	100	9,397	9,397
U 19	Cubic	Central	Private	3	6	0	10,589	0
X 5	Nobel Drive	North	City	1	6	100	10,543	10,543
X 7	Nobel Research **	North	City	0	1	100	9,064	9,064
Subtotal Level 1 (Stewardship) Monitoring and Management Cost							795,251	321,947
Data Tracking and Reporting (Bio III 1 day per week annually, City responsibility for all sites)							36,665	36,665
Changed Circumstances (refer to Table A-11 for detail, assumes City is responsible for all costs)							137,890	137,890
Contingency 13.3% Annually (refer to TWP 5 Section 3.1.3 for details)							42,832	42,832
TOTAL ANNUAL ONGOING COST							1,012,638	539,335
= Land not owned by City of San Diego			Bold	= Land not owned by City of San Diego or under the City of San Diego's land use authority				

Table A-8 Summary of Total Cost for VPHCP Preserve Monitoring and Management by Complex for the 36-Year Life of the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	% City Controlled Pools	Total Cost for VPMMP Implementation (36 Years)	City Cost for Required VPMMP Implementation (36 Years)
B 11	Mesa Norte	North	Private	0	422,475	0
B 5	Tierra Alta	North	Private	0	333,988	0
B 6	Lopez Ridge (CDFG)	North	State	0	317,638	0
B 7-8	Crescent Heights	North	City	100	317,638	317,638
	Lopez Ridge (City)	North	City	100	339,915	339,915
C 10-16	Winterwood	North	School District	0	674,303	0
C 17-18	Fieldstone	North	Private	0	0	0
C 27	Mira Mesa Market Center	North	Private	0	0	0
D 5-8	Parkdale Carroll Canyon	North	City	100	316,001	316,001
	Carroll Canyon	North	City	100	385,608	385,608
F 16-17	Menlo KM Parcel	Central	Private	0	0	0
H 1-10, 13-15, 18-23, 24-26	Del Mar Mesa (State/Federal)	North	State/Federal	0	2,164,530	0
	Del Mar Mesa (Private)	North	Private	0	370,427	0
	Del Mar Mesa (City/County)	North	City and County	84	1,155,831	975,564
	Rhodes	North	Private	0	523,073	0
H 17	Shaw Lorenz	North	Private	0	345,943	0
H 33	East Ocean Air Drive	North	Private	0	0	0
H 38	Carmel Mountain	North	City	100	357,898	357,898
H 39	Greystone Torrey Highlands	North	City	100	319,275	319,275
I 1	Arjons	North	Private	0	0	0
I 12	Pueblo Lands	North	City	100	336,641	336,641
I 6 B	Ford Leasing (Bob Baker)	North	Private	0	0	0
I 6 C	Facilities Development (Eastgate Miramar Associates)	North	Private	0	0	0
J 11 E	Slump Block Pools	South	Private	0	0	0
J 11 W	J 11 West	South	Private	0	0	0
J 12	J 12	South	Private	0	0	0
J 13 E	South Otay J 13 East	South	Private	0	0	0
J 13 N	South Otay 1 acre (private)	South	Private	0	0	0
	South Otay 1 acre (City)	South	City	100	0	0
J 13 S	South Otay J 13 South	South	Private	0	0	0
	Bachman	South	Private	0	0	0
J 14	Anderprises (Caltrans)	South	State	0	445,037	0
	Anderprises (City)	South	City	100	316,001	316,001
	Cal Terraces (South)	South	City	100	442,119	442,119
	Handler	South	Private	0	333,988	0
	Bachman	South	Private	0	316,001	0
J 15	Arnie's Point	South	Federal	0	1,138,988	0
J 16-18	Goat Mesa (Federal)	South	Federal	0	0	0
	Goat Mesa (Private)	South	Private	0	0	0
	Goat Mesa (City)	South	City	100	329,503	329,503
	Wruck Canyon	South	City	100	314,950	314,950

Table A-8 Summary of Total Cost for VPHCP Preserve Monitoring and Management by Complex for the 36-Year Life of the Project (2012 Dollars)

Complex ID	Name	Geographic Area	Management Responsibility	% City Controlled Pools	Total Cost for VPMMP Implementation (36 Years)	City Cost for Required VPMMP Implementation (36 Years)
J 2	Cal Terraces (North), Otay Mesa Road Parcels	South	City	100	542,050	542,050
	Clayton Parcel	South	City	100	317,638	317,638
	St. Jerome's	South	Private	0	0	0
J 20-21	La Media ITS	South	Private	0	0	0
J 21	La Media Swale South	South	Private	0	0	0
J 27	Empire Center	South	Private	0	0	0
J 28 E	La Media Swale North	South	Private	0	0	0
J 29	Lonestar W (Caltrans)	South	State	0	457,798	0
J 30	Lonestar E (Caltrans)	South	State	0	481,976	0
	Lonestar E (Private)	South	Private	0	718,146	0
J 31	Dennergy West	South	State	0	438,847	0
	Hidden Trails **	South	City	100	326,902	326,902
J 32	West Otay A	South	State	0	609,320	0
	West Otay B	South	City	100	333,988	333,988
	West Otay C	South	City	100	317,638	317,638
J 33	Sweetwater High School	South	School District	0	497,722	0
J 34	Bachman	South	Private	0	0	0
	Candlelight	South	Private	0	344,474	0
J 35	Brown Field	South	City	100	333,988	333,988
J 36	Southview	South	Private	0	0	0
J 4	Robinhood Ridge	South	City	100	432,297	432,297
	California Crossing	South	Private	0	0	0
K 5	Otay Lakes	Central	City	100	387,743	387,743
KK 2	Pasatiempo	Central	City	100	0	0
MM 1	Marron Valley	South	City	100	369,069	369,069
N 1-4	Teledyne Ryan	Central	Private	0	0	0
N 5-6	Montgomery Field	Central	City	100	440,482	440,482
N 7	Serra Mesa Library	Central	City	100	316,001	316,001
N 8	General Dynamics **	Central	City	100	382,832	382,832
NC	Li Collins	North	Private	0	0	0
	Kelton	South	City	100	0	0
OO	Salk Institute	North	Private	0	333,988	0
Q2	Mission Trails Regional Park School District	Central	School District	0	0	0
	Mission Trails Regional Park	Central	City	100	404,250	404,250
Q 3	Castlerock	North	Private	0	333,988	0
QQ	Tecolote Canyon	Central	City	100	0	0
R 1	Proctor Valley	South	City	100	346,961	346,961
U15	SANDER	Central	City	100	338,278	338,278
U 19	Cubic	Central	Private	0	0	0
X 5	Nobel Drive	North	City	100	379,558	379,558

Table A-9: Focal Vernal Pool Weed Control Cost Estimate Detail

Weed Control Task	Description of Activity	Cost/Acre	Cost/Pool
Level 2 Focal Vernal Pool Weed Control			
Dethatching 2	One-time visit (4 person crew) in pools with focal species and 20-foot buffer	\$3,000	\$277
Weed Control Level 2	Two visits (4 person crew) per spring and 20-foot foot buffer	\$2,500	\$231
TOTAL		\$5,500	\$508
Level 3 Focal Vernal Pool Weed Control			
Dethatching 3	One-time visit (4 person crew) in pools with focal species and 35-foot buffer	\$3,000	\$558
Weed Control Level 3	Four visits (4 person crew) per spring and 35-foot buffer	\$4,000	\$744
TOTAL		\$7,000	\$1,302

Level 2 Watershed Area

Avg pool size (acres)	0.018
Avg pool size (sq ft)	784.08
Avg pool radius	15.80
Radius + 20-ft buffer	35.80
Area of watershed (sq ft)	4024.83
Area of watershed (acres)	0.092
Watershed/pool ratio	5.13

Level 3 Watershed Area

Avg pool size (acres)	0.018
Avg pool size (sq ft)	784.08
Avg pool radius	15.80
Radius + 35-ft buffer	50.80
Area of watershed (sq ft)	8103.89
Area of watershed (acres)	0.186
Watershed/pool ratio	10.34

Note: Costs include labor and other direct costs such as field vehicle rental, fuel, herbicide, and equipment

Table A-10: City and Consultant Staff 2012 Rates

City Staff	Fully Loaded Rate	Rate with Travel
Senior Planner/Natural Resource Manager	\$89.37	\$92.18
Biologist I	\$62.05	\$64.86
Biologist III	\$88.14	\$90.95
Pesticide Applicator (PA)	\$57.57	\$60.38
Pesticide Applicator (PA) plus Herbicide	\$63.82	\$66.63
Grounds Maintenance Manager (GMM)	\$71.95	\$74.76
Ranger	\$58.85	\$61.66
Senior Ranger	\$71.71	\$74.52

Consultant Staff	Fully Loaded Rate	Rate with Travel
Senior Restoration Ecologist/Biologist	\$158.85	\$171.35
Biologist I	\$86.07	\$98.57
Maintenance/Restoration Crew	\$47.50	\$60.00
Maintenance/Restoration Crew plus Herbicide	\$53.75	\$66.25

Notes:

Fringe and overhead are included in the fully loaded rates

Rates with travel include \$2.81 per hour for City staff (City fleet car) and \$12.50 per hour for Consultant staff (rental vehicle plus fuel)

Herbicide Cost Assumptions:

Herbicide \$ per acre = 50
Hours for 1 acre herbicide spraying = 8
Herbicide \$/hr = 6.25

Table A-11: Cost Estimate for Changed Circumstances

Task	Assumptions	Staff	Title	Loaded Rate	Avg. Hours	Unit	Timing	Cost per Unit	Avg. Pools/ Complexes Requiring Enhanced Management*	Total Cost
Enhanced Fairy Shrimp Management										
Shrimp Cyst Collection	Performed by permitted biologist	Consultant	Bio I	\$99	0.5	Pool	Annual	\$49	32	\$1,587
Shrimp Cyst Bulking	Performed by permitted biologist	Consultant	Bio I	\$99	120	Complex	Annual	\$11,828	4	\$48,496
Shrimp Cyst Dispersal	Performed by permitted biologist	Consultant	Bio I	\$99	0.25	Pool	Annual	\$25	32	\$793
* Assumes 5% of focal species pools/complexes within the VPHCP Preserve will require enhanced fairy shrimp management annually									Avg. Annual Total	\$50,877
									Total for 36 Years	\$1,831,569
Post-Fire Management										
Perform Post-Fire Management	Assume 2 average size complex (50 vernal pools each) burns once every 10 years. Burned complexes will require certain Level 3 management activities (general maintenance, weed control, and seeding) to recover. Level 3 qualitative and quantitative (focal plants and shrimp pools) monitoring would also be necessary. Following the 5-year period, the site would be elevated to Level 1 status.	Consultant	Varied (see Table A-3 for specific Level 3 staff)	Varied (see Table A-3 for rates for Level 3 staff)	Varied (see Table A-3 for Level 3 hours for various tasks)	All pools and overall complex for limited Level 3 management and monitoring	Two complexes once per 10 years	Level 3 costs for specified management and monitoring activities	Total of 6 complexes (50 pools each) burn during life of the HCP Permit (36 years)	
									Total for 36 Years	\$3,132,471
									Avg. Annual Total	\$87,013

Total Avg. Annual **\$137,890**
Total over 36 Years **\$4,964,040**

Table A-12: Fence and Sign Installation Cost Assumptions

Complex ID	Name	Geographic Area	Fenced (Y/N)	20' Buffer Perimeter Around Complex (LF)
B 11	Mesa Norte	North	Y	
B 5	Tierra Alta	North	N	186
B 6	Lopez Ridge (CDFG)	North	Y	
B 7-8	Crescent Heights	North	Y	
	Lopez Ridge (City)	North	Y	
C 10-16	Winterwood	North	Y	
C 17-18	Fieldstone	North	Y	
C 27	Mira Mesa Market Center	North	Y	
D 5-8	Parkdale Carroll Canyon	North	Y	
	Carroll Canyon	North	Y	
F 16-17	Menlo KM Parcel	Central	Y	
H 1-10, 13-15, 18-23, 24-26	Del Mar Mesa (State/Federal)	North	Y	
	Del Mar Mesa (Private)	North	N	1,336
	Del Mar Mesa (City/County)	North	N	3,049
	Rhodes	North	Y	
H 17	Shaw Lorenz	North	Y	
H 33	East Ocean Air Drive	North	N	457
H 38	Carmel Mountain	North	Y	
H 39	Greystone Torrey Highlands	North	Y	
I 1	Arjons	North	Y	
I12	Pueblo Lands	North	N	1,185
I 6 B	Ford Leasing (Bob Baker)	North	Y	
I 6 C	Facilities Development (Eastgate Miramar Associates)	North	Y	
J 11 E	Slump Block Pools	South	N	1,180
J 11 W	J 11 West	South	N	2,113
J 12	J 12	South	N	1,416
J 13 E	South Otay J 13 East	South	N	1,648
J 13 N	South Otay 1 acre (private)	South	Y	
	South Otay 1 acre (City)	South	N	2,514
J 13 S	South Otay J 13 South	South	N	5,719
	Bachman	South	N	203
J 14	Anderprises (Caltrans)	South	N	5,361
	Anderprises (City)	South	N	226
	Cal Terraces (South)	South	Y	
	Handler	South	N	2,249
	Bachman	South	Y	
J 15	Arnie's Point	South	Y	
J 16-18	Goat Mesa (Federal)	South	N	641
	Goat Mesa (Private)	South	N	220
	Goat Mesa (City)	South	Y	
	Wruck Canyon	South	N	983
J 2	Cal Terraces (North), Otay Mesa Road Parcels	South	Y	
	Clayton Parcel	South	N	5,278
	St. Jerome's	South	N	1,366
J 20-21	La Media ITS	South	N	6,354
J 21	La Media Swale South	South	N	1,630
J 27	Empire Center	South	N	812
J 28 E	La Media Swale North	South	N	1,356
J 29	Lonestar W (Caltrans)	South	Y	
J 30	Lonestar E (Caltrans)	South	Y	
	Lonestar E (Private)	South	Y	
J 31	Denberry West	South	Y	
	Hidden Trails	South	Y	
J 32	West Otay A	South	N	3,182
	West Otay B	South	N	1,146
	West Otay C	South	N	965
J 33	Sweetwater High School	South	Y	
J 34	Bachman	South	N	2,102
	Candlelight	South	N	4,392
J 35	Brown Field	South	Y	
J 36	Southview	South	N	2,836
J 4	Robinhood Ridge	South	Y	
	California Crossing	South	N	1,323
K 5	Otay Lakes	Central	Y	
KK 2	Pasatiempo	Central	N	1,383
MM 1	Marron Valley	South	Y	
N 1-4	Teledyne Ryan	Central	Y	
N 5-6	Montgomery Field	Central	Y	
N 7	Serra Mesa Library	Central	Y	
N 8	General Dynamics	Central	Y	
NC	Li Collins	North	Y	
	Kelton	South	Y	
OO	Salk Institute	North	Y	
Q2	Mission Trails Regional Park School District	Central	N	300
	Mission Trails Regional Park	Central	Y	
Q 3	Castlerock	North	Y	
QQ	Tecolote Canyon	Central	N	1,738
R 1	Proctor Valley	South	Y	
U15	SANDER	Central	N	5,893
U 19	Cubic	Central	N	3,793
X 5	Nobel Drive	North	Y	
X 7	Nobel Research	North	Y	
Total				76,535

Type	Cost per Linear Foot (LF)
Peeler Log	\$7.61
3-strand Wire	\$5.50
Average Cost	\$6.56
Installed LF/hr	20
Labor/hr per LF	\$3.74
Loaded Rate/hr per LF	\$10.29

Note: Costs include fence and sign materials plus installation by a GMM

Table A-13: City of San Diego VPHCP Preserve Monitoring and Management Comprehensive Cost Estimate by Complex for Alternative 1 (Baseline)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total One-Time Fence/Sign Installation Cost	City One-Time Fence/Sign Installation Cost	Total Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	City Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	Required VPMMP Mngmt & Monitoring Level	Total One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	City One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	Total Cost for VPMMP Implementation (36 Years)	City Cost for Required VPMMP Implementation (36 Years)
B 11	Mesa Norte	North	Private	16	24	0	0	0	11,735	0	Level 1	0	0	422,475	0
B 6	<i>Lopez Ridge (CDFG)</i>	<i>North</i>	<i>State</i>	<i>1</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>8,823</i>	<i>0</i>	<i>Level 1</i>	<i>0</i>	<i>0</i>	<i>317,638</i>	<i>0</i>
B 7-8	Lopez Ridge (City)	North	City	10	2	100	0	0	9,442	9,442	Level 1	0	0	339,915	339,915
C 10-16	<i>Winterwood</i>	<i>North</i>	<i>School District</i>	<i>27</i>	<i>2</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>9,533</i>	<i>0</i>	<i>SSMP</i>	<i>378,779</i>	<i>0</i>	<i>674,303</i>	<i>0</i>
C 17-18	Fieldstone	North	Private	8	0	0	0	0	8,823	0	None2	0	0	0	0
D 5-8	Parkdale Carroll Canyon	North	City	0	0	100	0	0	8,778	8,778	Level 1	0	0	316,001	316,001
	Carroll Canyon	North	City	76	5	100	0	0	10,711	10,711	Level 1	0	0	385,608	385,608
H 1-10, 13	<i>Del Mar Mesa (State/Federal)</i>	<i>North</i>	<i>State/Federal</i>	<i>154</i>	<i>10</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>12,463</i>	<i>0</i>	<i>SSMP</i>	<i>1,778,177</i>	<i>0</i>	<i>2,164,530</i>	<i>0</i>
15,18-23,	Del Mar Mesa (Private)	North	Private	2	1	0	13,752	0	9,110	0	SSMP	88,019	0	370,427	0
24-26	Del Mar Mesa (City/County)	North	City and County	64	8	84	31,384	26,489	11,389	9,613	SSMP	802,758	677,557	1,155,831	975,564
H 17	Shaw Lorenz	North	Private	0	1	0	0	0	9,064	0	SSMP	64,945	0	345,943	0
H 38	Carmel Mountain	North	City	0	2	100	0	0	9,351	9,351	SSMP	68,013	68,013	357,898	357,898
H 39	Greystone Torrey Highlands	North	City	6	0	100	0	0	8,869	8,869	Level 1	0	0	319,275	319,275
I12	Pueblo Lands	North	City Enterprise	0	2	100	12,197	12,197	9,351	9,351	Level 1	0	0	336,641	336,641
J 11 E	Slump Block Pools	South	Private	0	0	0	12,146	0	8,778	0	None1	0	0	0	0
J 11 W	J 11 West	South	Private	0	1	0	21,750	0	9,064	0	None1	0	0	0	0
J 12	J 12	South	Private	0	0	0	14,575	0	8,778	0	None1	0	0	0	0
J 13 E	South Otay J 13 East	South	Private	0	0	0	16,963	0	8,778	0	None1	0	0	0	0
J 13 N	South Otay 1 acre (City)	South	City	3	0	100	25,877	25,877	8,914	8,914	None	0	0	0	0
J 14	<i>Anderprises (Caltrans)</i>	<i>South</i>	<i>State</i>	<i>2</i>	<i>7</i>	<i>0</i>	<i>55,182</i>	<i>0</i>	<i>10,875</i>	<i>0</i>	<i>SSMP</i>	<i>107,899</i>	<i>0</i>	<i>445,037</i>	<i>0</i>
	Anderprises (City)	South	City	0	0	100	2,326	2,326	8,778	8,778	None	0	0	316,001	316,001
	Cal Terraces (South)	South	City	63	36	100	0	0	12,281	12,281	Level 1	0	0	442,119	442,119
	Bachman	South	Private	0	0	0	0	0	8,778	0	Level 1	0	0	316,001	0
J 15	<i>Arnie's Point</i>	<i>South</i>	<i>Federal</i>	<i>62</i>	<i>57</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>12,099</i>	<i>0</i>	<i>SSMP</i>	<i>763,912</i>	<i>0</i>	<i>1,138,988</i>	<i>0</i>
J 16-18	<i>Goat Mesa (Federal)</i>	<i>South</i>	<i>Federal</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>6,598</i>	<i>0</i>	<i>8,778</i>	<i>0</i>	<i>None</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
	Goat Mesa (Private)	South	Private	0	0	0	2,265	0	8,778	0	None1	0	0	0	0
	Goat Mesa (City)	South	City	4	0	100	0	0	8,823	8,823	Level 2	38,335	38,335	329,503	329,503
	Wruck Canyon	South	City Enterprise	0	0	100	10,118	10,118	8,778	8,778	Level 2	25,282	25,282	314,950	314,950
J 2	Cal Terraces (North), Otay Mesa Road Parcels	South	City	219	216	100	0	0	15,057	15,057	Level 1	0	0	542,050	542,050
	Clayton Parcel	South	City	1	0	100	54,328	54,328	8,823	8,823	Level 1	0	0	317,638	317,638
J 27	Empire Center	South	Private	9	0	0	8,358	0	8,823	0	None2	0	0	0	0
J 28 E	La Media Swale North	South	Private	0	0	0	13,958	0	8,778	0	None1	0	0	0	0
J 29	<i>Lonestar W (Caltrans)</i>	<i>South</i>	<i>State</i>	<i>9</i>	<i>1</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>9,110</i>	<i>0</i>	<i>SSMP</i>	<i>175,390</i>	<i>0</i>	<i>457,798</i>	<i>0</i>
J 30	<i>Lonestar E (Caltrans)</i>	<i>South</i>	<i>State</i>	<i>0</i>	<i>70</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>11,644</i>	<i>0</i>	<i>SSMP</i>	<i>120,997</i>	<i>0</i>	<i>481,976</i>	<i>0</i>
	Lonestar E (Private)	South	Private	33	0	0	0	0	8,960	0	SSMP	440,396	0	718,146	0
J 31	<i>Dennerly West</i>	<i>South</i>	<i>State</i>	<i>0</i>	<i>38</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>11,644</i>	<i>0</i>	<i>SSMP</i>	<i>77,869</i>	<i>0</i>	<i>438,847</i>	<i>0</i>
	Hidden Trails **	South	City	0	1	100	0	0	9,064	9,064	Level 2	27,774	27,774	326,902	326,902
J 32	<i>West Otay A</i>	<i>South</i>	<i>State</i>	<i>15</i>	<i>9</i>	<i>0</i>	<i>32,753</i>	<i>0</i>	<i>11,494</i>	<i>0</i>	<i>SSMP</i>	<i>252,999</i>	<i>0</i>	<i>609,320</i>	<i>0</i>
	West Otay B	South	City	0	0	100	11,796	11,796	8,778	8,778	SSMP	61,876	61,876	333,988	333,988
	West Otay C	South	City	1	0	100	9,933	9,933	8,823	8,823	Level 1	0	0	317,638	317,638
J 33	<i>Sweetwater High School</i>	<i>South</i>	<i>School District</i>	<i>7</i>	<i>8</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>11,208</i>	<i>0</i>	<i>SSMP</i>	<i>150,287</i>	<i>0</i>	<i>497,722</i>	<i>0</i>
J 34	Bachman	South	Private	0	0	0	21,636	0	8,778	0	None1	0	0	0	0
J 35	Brown Field	South	City Enterprise	0	0	100	0	0	8,778	8,778	Level 3	61,876	61,876	333,988	333,988
J 36	Southview	South	Private	0	12	0	29,192	0	11,644	0	None1	0	0	0	0
J 4-5	Robinhood Ridge	South	City	50	41	100	0	0	12,008	12,008	Level 1	0	0	432,297	432,297
	California Crossing	South	Private	0	5	0	13,618	0	10,211	0	None (reporting)	0	0	0	0

Table A-13: City of San Diego VPHCP Preserve Monitoring and Management Comprehensive Cost Estimate by Complex for Alternative 1 (Baseline)

Complex ID	Name	Geographic Area	Management Responsibility	Total Pools with Plant Focal Species	Total Pools with Shrimp Focal Species	% City Controlled Pools	Total One-Time Fence/Sign Installation Cost	City One-Time Fence/Sign Installation Cost	Total Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	City Annual Ongoing Cost for Level 1 Mngmt & Monitoring (\$)	Required VPMMP Mngmt & Monitoring Level	Total One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	City One-Time* Cost for Required VPMMP Mngmt & Monitoring Level 2 or 3 or SSMP (\$)	Total Cost for VPMMP Implementation (36 Years)	City Cost for Required VPMMP Implementation (36 Years)
K 5	Otay Lakes	Central	City Enterprise	46	6	100	0	0	10,771	10,771	Level 1	0	0	387,743	387,743
MM 1	Marron Valley	South	City Enterprise	0	5	100	0	0	10,211	10,211	Level 2	32,101	32,101	369,069	369,069
N 5-6	Montgomery Field	Central	City Enterprise	129	10	100	0	0	12,236	12,236	Level 1	0	0	440,482	440,482
N 7	Serra Mesa Library	Central	City	0	0	100	0	0	8,778	8,778	Level 1	0	0	316,001	316,001
N 8	General Dynamics **	Central	City	20	6	100	0	0	10,634	10,634	Level 1	0	0	382,832	382,832
NC N	Li Collins	North	Private	0	0	0	0	0	8,778	0	None	0	0	0	0
NC S	Kelton	South	City	0	0	100	0	0	8,778	8,778	None	0	0	0	0
Q2	<i>Mission Trails Regional Park School District</i>	<i>Central</i>	<i>School District</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>3,088</i>	<i>0</i>	<i>8,778</i>	<i>0</i>	<i>None1</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
	Mission Trails Regional Park	Central	City	0	6	100	0	0	10,498	10,498	SSMP	78,818	78,818	404,250	404,250
QQ	Tecolote Canyon	Central	City	0	0	100	17,890	17,890	8,778	8,778	None	0	0	0	0
R 1	Proctor Valley	South	City Enterprise	0	3	100	0	0	9,638	9,638	Level 1	0	0	346,961	346,961
X 5	Nobel Drive	North	City	1	6	100	0	0	10,543	10,543	Level 1	0	0	379,558	379,558
X 7	Nobel Research **	North	City	0	1	100	0	0	9,064	9,064	Level 1	0	0	326,321	326,321
Subtotal VPMMP Monitoring and Management Cost									580,835	294,950		5,596,503	1,071,633	19,970,611	10,391,193
Data Tracking and Reporting (Bio III 1 day per week annually, City responsibility for all sites)									36,665	36,665				1,319,932	1,319,932
Changed Circumstances									124,716	124,716				4,489,780	4,489,780
Contingency 13.3% Annually									39,228	39,228				1,412,220	1,412,220
Total One-Time Fence/Sign Installation Cost														441,681	170,954
One-Time Cost for Vernal Pool HGM Baseline Survey														108,476	68,358
TOTAL COST							441,681	170,954	781,444	495,559		5,596,503	1,071,633	27,742,700	17,852,437
	= Land not owned by City of San Diego.			<i>Bold</i>	= Land not owned by City of San Diego or under the City of San Diego's land use authority.										

SSMP = Site-specific Management Plan, not part of VPMMP. For cost-estimating purposes, Level 3 costs are assumed.

SSA = Site-Specific Action, costs is based on specific actions specified in TWP 3&4 VPMMP Attachment A

None₁ = These sites are privately held and may seek development entitlement in the future. During the development entitlement process the City will ensure the property owner implements the Recommended Management.

None₂ = These site have been developed pursuant to prior approval by City of San Diego. No management was required at that time, nor is any management being required as part of this HCP. As funding becomes available the City may work with the owner to implement the Additional Recommended Management.

* = One-time costs are assumed for a 3-year period for monitoring and management for VPMMP-required Level 2 and 5-years for Level 3. After the initial 3 or 5-years, all complexes are assumed at the annual ongoing Level 1 cost. Sites at Level 1 are NOT included in this column as they are part of the on-going annual costs.

** = Development projects were approved on these three sites after the adoption of the City of San Diego's Multiple Species Conservation Plan (MSCP). The City was granted a Conservation Easement as a condition of the discretionary land use entitlement. While the ownership is private, the City committed to provide the biological management of these sites as a condition easement pursuant to the requirements of the MSCP.